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Operational energy Efficiency for Users (OEU); Plastic Optical Fiber Plugtests to determine the interoperability of networking equipment manufactured by different vendors

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Contents

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Foreword

This Group Report (GR) has been produced by ETSI Industry Specification Group (ISG) Operational energy Efficiency for Users (OEU). The present document is a Position Paper authored by the ICT users in the three main domains of ICT Sites, Smart Cities and Electrical/Electronic Equipment through the support of eG4U, the European Non-Governmental Organisation (NGO) of ICT users from public and private sector, working together in order to improve Energy Management & Waste monitoring in these main domains.

The interoperability among different suppliers for 100 Mbps and 1 Gbps Ethernet transmissions over Plastic Optical Fibre (POF) cabling system are specified by ETSI in ETSI TS 105 175-1 [i.2] whereas ETSI TS 105 175-1-1 [i.3] specifies the application requirements for physical layer specifications and ETSI TS 105 175-1-2 [i.4] the physical interface.

The present document intends to specify the Test Suite Structure (TSS) and associated Test Purposes (TPs) which qualifies the Ethernet interworking between networking elements relying on the POF transmission physical media for which IEEE 802.3bv [i.7] specifies the Medium Dependent Interface (MDI) mechanical interface.

The testing suite introduced into the present document pursue the objective to offer a common reference guideline to determine the conformance of the POF networking equipment's during the ETSI Plugfest.

Modal verbs terminology

In the present document "**should**", "**should not**", "**may**", "**need not**", "**will**", "**will not**", "**can**" and "**cannot**" are to be interpreted as described in clause 3.2 of the ETSI Drafting Rules (Verbal forms for the expression of provisions).

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Executive summary

To leverage vendors' interoperability through standards, ETSI regularly organizes Plugtests and Plugfest events for two main purposes:

- providing essential feedback to the technical committees to help them improving the standard;
- enabling engineers to get together to test the interoperability of their implementation of the standard.

The present document introduces the interoperability tests of networking equipment manufactured by different vendors for Home and Small Office Home Office (SoHo) optical networks made of Plastic Optical Fibre (POF).

Introduction

Plastic Optical Fibre (POF) has recently emerged as a low-cost alternative to traditional twisted pair copper cabling in Home and Small Office Home Office (SoHo). POF offers several benefits to the user amongst which the ease of installation is particularly significant (can even be cut with a simple pair of scissors). POF is lightweight, robust and uses 650 nm red light (LED) which makes the technology completely safe for the user's vision. Furthermore, this safety feature is of extra benefit to the installer because the red light is extremely clear for the human eye and therefore helps to diagnose if the data communication link is operational.

Significant upgrades on the Fibre to the X (FTTH & FTTB) technologies and their market penetrations have enabled the telecom operator to deliver to their subscribers very high speed bandwidth capacities such as symmetrical Gigabit connection. At the same time, GAFA and innovative internet players shape the new trends to feed customers' expectations in terms of services and applications. These progresses advocate for the lifting of the Home and Enterprises networking infrastructures such as the backbone and the access.

Digital transmissions through POF have been introduced decades ago. The automotive industry has been a serious catalyst to the introduction of the technology through the deployment within the car as a medium to interconnect the infotainment system (audio, video, navigation system, voice and gaming) and even critical elements such as airbags. To achieve this networking, the automotive manufacturers have designed a bus protocol optimized for this industry: the Media Oriented Systems Transport (MOST). The serial MOST bus enable to transport audio, video, voice and data signals at speeds of 25 Mbps (MOST25) and 150 Mbps (MOST150) on a POF physical media. In 2007, with the introduction of MOST150 the technology provided the capability to implement Ethernet networking in automobiles.

In contrary to Single-Mode or Multi-Mode Glass Optic Fibre (GOF), POF cable has a larger core diameter which results in lower data rate and shorter reach. Nevertheless, such larger fibre core offers a better accuracy of alignment between the optical transmission Light Emitting Diode (LED) and the POF light guide. The data transmission is almost resilient even when the fibre is strongly bended or slightly damaged which makes this rugged cable convenient for Do It Yourself (DIY) installations.

Over the last few years, advances in LED and Vertical Cavity Surface Emitting Laser (VCSEL) technology have now enabled POF to support high data rates such as Gigabit/s and above. Such bandwidth capability has led the IEEE 802.3 working group to specify an amendment (IEEE 802.3bv [i.7]) to the Ethernet protocol to support 1 000 Mb/s Operation over Plastic Optical Fibre. Because Ethernet networking is the dominating technology within Home Area Network (HAN) and enterprise Local Area Network (LAN), Gigabit POF networking is certainly a great media to replace or complement traditional twisted pair wiring such as ISO/IEC 11801 [i.1] (for example CAT5E, CAT6E, CAT7).

First generation of the technology provides Fast Ethernet link over POF (reusing the 100BASE-FX PHY from IEEE 802.3u [i.5]) with a typical reach of 100 metres, comparable to a standard CAT5 solution, whereas recent amendment provides a Gigabit Ethernet link over POF (through new 1000BASE-RH from IEEE 802.3bv [i.7] with a typical reach of 50 metres.

HAN and to a certain extend SOHO network infrastructures have been mainly leveraging Wi-Fi Wireless technologies such as IEEE 802.11ac [i.12] or IEEE 802.11ad [i.13] for interconnecting device such as PC, laptop, IP camera and even triple-play Set-Top-Box (STB) to avoid the obstacle of wiring.
However, every home is different in its design and layout, wireless spectrum can already be congested with signals coming from other Industrial, Scientific and Medical (ISM) wireless technologies (e.g. DECT phone, Zigbee®) or perturbed (e.g. microwave), and Quality of Service is becoming a necessity for many applications & services (e.g. live video security streaming, IP TV, audio streaming). In such situations, wired infrastructure is the only viable alternative.

The present document describes a POF Plugtests. The purpose of the tests is to investigate if there are any problems of interoperability when multiple POF elements manufactured by different vendors are simultaneously present in the same Ethernet networking infrastructure for Homes and Enterprises networks.

A POF networking infrastructure is composed of various physical elements such as POF PMMA cable, POF optical transceiver, POF media converter, POF Ethernet switch and IP networked host over Ethernet.

1 Scope

The present document contains the Mechanical, Physical and Operational Test Suite (MPOTS) for networking equipment relying on Plastic Optical Fibre digital communications for both FAST (IEEE 802.3u [i.5], 100 Mbps) and GIGABIT (IEEE 802.3bv [i.7], 1 000 Mbps) Ethernet data transfers along the systems interoperability specifications described in ETSI TS 105 175-1 [i.2], ETSI TS 105 175-1-1 [i.3] and ETSI TS 105 175-1-2 [i.4].

The present document forms the guidelines to lead the technical organization of the POF Plugtests event, in Bordeaux, France from 6th to 8th June 2017. The present document is intended to be upgraded for future interoperability events.

The present document describes:

- the testbed architecture showing with POF systems and networking component are involved and how they are going to interwork;
- the operational scenario used during the tests;
- the interoperability test descriptions describing the scenarios, which the participants will follow to perform the interoperability tests.

2 References

2.1 Normative references

Normative references are not applicable in the present document.

2.2 Informative references

References are either specific (identified by date of publication and/or edition number or version number) or non-specific. For specific references, only the cited version applies. For non-specific references, the latest version of the referenced document (including any amendments) applies.

NOTE: While any hyperlinks included in this clause were valid at the time of publication, ETSI cannot guarantee their long term validity.

The following referenced documents are not necessary for the application of the present document but they assist the user with regard to a particular subject area.

[i.1] ISO/IEC 11801: "Information technology -- Generic cabling for customer premises".

[i.2] ETSI TS 105 175-1: "Access, Terminals, Transmission and Multiplexing (ATTM); Plastic Optical Fibre System Specifications for 100 Mbit/s and 1 Gbit/s".

[i.3] ETSI TS 105 175-1-1: "Access, Terminals, Transmission and Multiplexing (ATTM); Plastic Optical Fibres; Part 1: Plastic Optical Fibre System Specifications for 100 Mbit/s and 1 Gbit/s; Sub-part 1: Application requirements for physical layer specifications for high-speed operations over Plastic Optical Fibres".

[i.4] ETSI TS 105 175-1-2: "Access, Terminals, Transmission and Multiplexing (ATTM); Plastic Optical Fibres; Part 1: Plastic Optical Fibre System Specifications for 100 Mbit/s and 1 Gbit/s; Sub-part 2: 1 Gbit/s and 100 Mbit/s physical layer for Plastic Optical Fibres".

[i.5] IEEE 802.3u™: "IEEE Standards for Local and Metropolitan Area Networks-Supplement -- Media Access Control (MAC) Parametres, Physical Layer, Medium Attachment Units and Repeater for 100Mb/s Operation, Type 100BASE-T (Clauses 21-30)".

[i.6] IEEE 802.3z™: "Media Access Control Parametres, Physical Layers, Repeater and Management Parametres for 1,000 Mb/s Operation, Supplement to Information Technology - Local and Metropolitan Area Networks - Part 3: Carrier Sense Multiple Access with Collision Detection (CSMA/CD) Access Method and Physical Layer Specifications".

[i.7] IEEE 802.3bv™: "IEEE Standard for Ethernet Amendment 9: Physical Layer Specifications and Management Parametres for 1000 Mb/s Operation Over Plastic Optical Fibre".

[i.8] IEC 60793-2-40 ed.3.0:2009: "Optical fibres - Part 2-40: Product specifications - Sectional specification for category A4 multimode fibres".

[i.9] IEC 60793-2-40 ed.2.0:2006 : "Optical fibres - Part 2-40: Product specifications - Sectional specification for category A4 multimode fibres".

[i.10] ETSI ES 201 873-1: "Methods for Testing and Specification (MTS); The Testing and Test Control Notation version 3; Part 1: TTCN-3 Core Language".

[i.11] ETSI TS 102 950-2: "Methods for Testing and Specification (MTS); TTCN-3 Conformance Test Suite; Part 2: Test Suite Structure and Test Purposes (TSS&TP)".

[i.12] IEEE 802.11ac™: "IEEE Standard for Information technology -- Telecommunications and information exchange between systems -- Local and metropolitan area networks -- Specific requirements -- Part 11: Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) Specifications -- Amendment 4: Enhancements for Very High Throughput for Operation in Bands below 6 GHz".

[i.13] IEEE 802.11ad™: "IEEE Standard for Information technology -- Telecommunications and information exchange between systems--Local and metropolitan area networks--Specific requirements -- Part 11: Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) Specifications -- Amendment 3: Enhancements for Very High Throughput in the 60 GHz Band".

[i.14] IETF RFC 2326: "Real Time Streaming Protocol (RTSP)".

[i.15] IETF RFC 7230: "Hypertext Transfer Protocol (HTTP/1.1): Message Syntax and Routing".

[i.16] IETF RFC 959: "File Transfer Protocol (FTP)".

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the following terms and definitions apply:

POF cable: plastic optical fibre is an optical fibre that is made out of polymethylmethacrylate

POF cable in-line connector: passive optical device which enables to interconnect two POF cable

POF connector-less clamping socket: interconnect technology which enable instant termination of bare plugless POF cable to a POF optical transceiver

POF Ethernet Media converter: active equipment operating Ethernet media conversion between BASE-FX POF MDI optical interfaces and BASE-T UTP copper interfaces

POF Ethernet Switch: active equipment operating Ethernet switching which comprises BASE-FX POF MDI optical interfaces and BASE-T UTP copper interfaces

3.2 Abbreviations

For the purposes of the present document, the following abbreviations apply:

AT Active Tests

BI	Invalid Behaviour tests
BV	Valid Behaviour tests
CIFS	Common Internet File System
CPU	Computer Processing Unit
EG4U	association of users for life cycle resource management for information communication technology
FTP	File Transfer Protocol
FTTB	Fibre To The Business
FTTH	Fibre To The Home
GAFA	Google© Apple® Facebook® Amazon®
GB	GygaByte
GI	Graded Index
GI-POF	Graded Index Plastic Optical Fiber
GOF	Glass Optical Fibre
HAN	Home Area Network
HD	High Definition
HEVC	High Efficiency Video Coding
HOST-C	Host Consumer
HOST-S	Host Server
ICMP	Internet Control Message Protocol
IP	Internet Protocol
ISM	Industrial, Scientific and Medical
KB	KiloBytes
LAN	Local Area Network
LED	Light Emitting Diode
MAC	Medium Access Control
MDI	Medium Dependent Interface
MMF	Multi Mode Fiber
MOST	Media Oriented Systems Transport
MPC™	Media Player Classic
MPOTS	Mechanical, Physical and Operational Test Suite
MSS	Maximum Segment Size
MTU	Maximum Transmission Unit
NFS	Network File System
NGO	Non-Governmental Organization
NRZ	Non Return to Zero
OS	Operating System
PAM	Pulse-Amplitude Modulation
PC	Personal Computer
PF-POF	PerFluorinated Plastic Optical Fiber
PHY	Physical
PMD	Physical Medium Dependent
PMMA	PolyMethylMethAcrylate
POF	Plastic Optical Fibre
PSPT	Passive & Semi-Passive Tests
RTSP	Real Time Streaming Protocol
RX	Receive Interface
SAT	Semi-Active Tests
SCTP	Stream Control Transmission Protocol
SDO	Standards Development Organization
SI	Step Index
SMB	Server Message Block
SMF	Single Mode Fiber
SNR	Signal Noise Ratio
SOHO	Small Office Home Office
STB	Set-Top-Box
TCP	Transmission Control Protocol
TCP/IP	Transmission Control Protocol over Internet Protocol
TS	Test Suite
TSS	Test Suite Structure
TV	TeleVision
TX	Transmit Interface

UDP	User Datagram Protocol
UHD	Ultra High Definition
URI	Universal Resource Identifier
VCSEL	Vertical Cavity Surface Emitting Laser
VDE	Verband der Elektrotechnik Elektronik Informationstechnik
VLC™	Video LAN Client

4 POF networking Plugtests

4.1 Purpose of the Plugtests

The goal of the interoperability test is to verify that Step Index (SI) Plastic Optical Fibre (POF), related passive & active equipment and elements (media and device) can interwork together from both the physical and mechanical specifications of the media and interface as well as from the networking operations using the Ethernet protocols implementations of the device.

Ethernet networking operation will be tested per two different bitrates: 100 Mbps through IEEE 802.3u [i.5] and 1 Gbps through IEEE 802.3bv [i.7].

Before the effort by the IEEE Standards Development Organization (SDO), the Ethernet PHY project was initiated in VDE (Verband der Elektrotechnik Elektronik Informationstechnik) organization. Whereas ETSI TS 105 175-1-2 [i.4] describes a physical layer for transmitting 100 Mbps and 1 Gbps dull duplex over POF.

Through the Test Suite Structure, defined in clause 4.4, and the application scenarios, defined in clause 4.2, the Plugtests will cover two groups of tests: the mechanicals and physical group and the operational group.

In the test of the first group, point to point networking will be the reference cabling architecture whereas in the second group, point to multi-point networking will be the reference cabling architecture. These infrastructures types respectively imply two and three or more POF equipment. The former infrastructure will only imply two pieces of equipment (POF media converter or POF Ethernet switch) whereas the later infrastructure will simultaneously imply two POF media converters and one POF Ethernet switch.

POF media differs from traditional optical fibre in material as they are made of plastic and not glass. Furthermore, POF media core and cladding have bigger dimension than those of glass optical fibre (GOF). Whereas glass fibres have figures for the diameters ranging from 9 um for the core and 125 um for the cladding in Single-Mode Fibre (SMF) and 50 um for the core and 125 um for the cladding in Multi-Mode Fibre (MMF), plastic fibre has much larger figures for these diameters: commonly the core is 980 um and the cladding is 1 000 um for SI. Final POF cable diameter, which includes the jacket, is ranging from 1,5 mm to 2,2 mm. whereas this larger one is the most frequently used.

POF networking does not rely on laser for generating the light source but rather on Light Emitting Diode (LED) operating in the red light frequency area at 650 nm. Although resulting in lower data rates than glass fibre, the larger core of the plastic fibre offers to the media less constrain regarding the accuracy of the alignment between the LED and the fibre. Actual state of the art in POF duplex networking make use of a dual fibre cable where each single fibre is associated with a transmit channel. Current researches are targeting to enable duplex operation through a single fibre.

Whereas GOF cables are made of glass quartz combined with impurities to produce the targeted refractive index, POF cables are made of polymethylmethacrylate (PMMA) for the core and of fluoropolymer for the cladding. Two types of POF cabling are available Step Index (SI) according to IEC 60793-2-40 ed.3.0:2009: Type A4a.2 [i.8] and Grade Index (GI) according to IEC 60793-2-40 ed.2.0:2006: Type A4ag [i.9]. The first type of fibre is commonly referred as POF whereas the second one as PF-POF (made with anamorphous perfluorinated material) or GI-POF and offers much higher performance and enable longer reach.

The larger core/cladding dimensions combined with the plastic material provide to POF plastic wiring a more rugged cable capable of withstanding a significantly tighter bending radius than GOF silica wiring. Optical transmission within POF cable can continue to operate even in the presence of a few cable knots (bend radius $\geq$ 25 mm is tolerable whereas radius < 10 mm will damage de cable strongly). This flexibility is however counterbalanced by a significant loss value of 18 dB/100 m reducing therefore the distance which can be achieved with this data cabling medium.

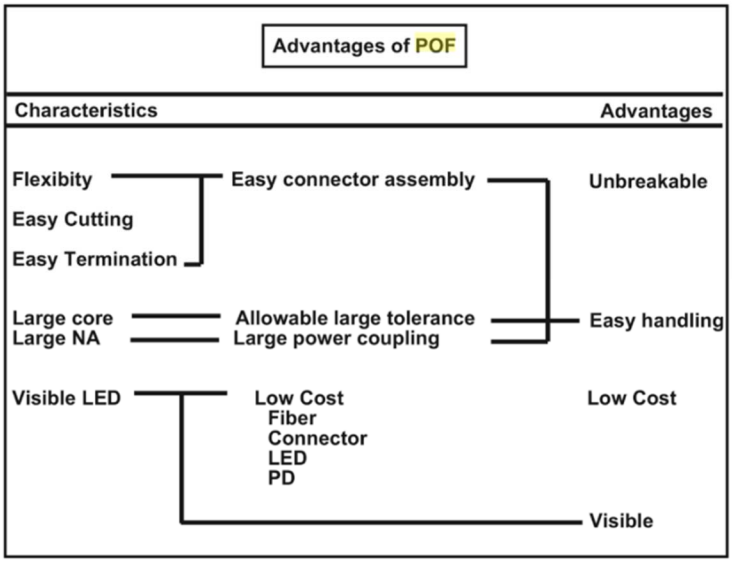

Figure 1: Advantages of POF

The Plugtests do not intend to determine the conformance of the POF material characteristics, the LED wavelength accuracy, the Signal Noise to Ratio (SNR) measurement nor the optical loss as such testing would require complex and onerous equipment. Considerations about the conformance testing of the Ethernet protocol implementations are also outside the scope of the present Plugtests.

POF is an affordable and simple technology that can replace or complement twisted pair cabling for a Do It Yourself (DIY) installation strategy within building. The present Plugtests intend to showcase that POF networking in a plug and play easy to deploy data infrastructure.

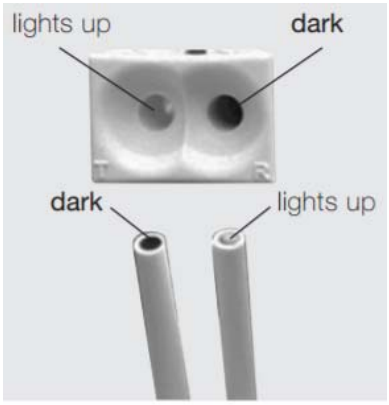

Figure 2: Simple DIY installation

4.2 Application scenario

4.2.1 Application oriented Plugtests

The present Plugtests intend to be a suite of tests related to POF Ethernet networking which does not imply the access and usages of complex and expensive testing equipment. The Plugtests rather suggest a reference application scenario focusing on digital services delivery between two or more network host addressed through an IP layer 3 network architecture relying on a layer 2 Ethernet switching operation across a POF wired Local Area network (LAN).

According to each test unit described in clauses 4.5.1 to 4.5.3, the operating digital service might or might not be impacted. In this latter case, the test unit will also cover the operation to achieve service delivery recovery.

4.2.2 High-resolution video streaming service

This application scenario suggests a digital service delivery which consists in an audio/video streaming. This one requires the setup of a (very) high resolution:

- an audio/video live stream generated by either a HD/4K standalone video security camera; or
- audio/video live stream captured from a HD/4K webcam connected to a host computer; or
- an HD/4K audio/video recording streamcasted from a computer host;

to be consumed by a receiving host rendering the network streamed audio/video content onto an audio-visual interface such as HD/4K display or monitor.

The (live) audio/video stream will be encoded through H.264 digital transmission codecs or sourced from a H.264 recording packed in a MP4 or MKV container. The content will be transported onto a Hyper Text Transport Protocol (HTTP [i.15]) or a Real Time Streaming Protocol (RTSP [i.14]) unicast stream operating on top of the POF networking infrastructure.

The audio/video stream source, named VIDEOSOURCE, can be generated:

- through the live audio/video capture from a HD/4K networked IP security camera; or
- through the live audio/video capture from an HD/4K webcam associated with a RTSP streaming application such as Video Lan Client (VLC™) or Media Player Classic (MPC™) operating on a host computer; or
- through an audio/video streaming from an HD/4K recording associated with a streaming application such as VLC™ or MPC™ operating on a host computer.

The audio/video stream consumer, named VIDEOCONSUMER, will display the HD/4K IP security camera input streamed from the networked camera:

- through a dedicated IP security monitor equipment; or
- through a dedicated audio/video stream rendering application associated with the IP security camera vendor operating on a host computer; or
- through an open audio/video RTSP stream rendering application such as VLC™ or MPC™ operating on a host computer; or
- through a Smart TV display with a streaming client supporting the associated audiovisual stream format.

The audio/video stream consumer, named VIDEOCONSUMER, will display the HD/4K webcam input streamed from the host computer:

- through a dedicated audio/video stream rendering application associated with the webcam vendor; or
- through an open audio/video RTSP stream rendering application such as VLC™ or MPC™ operating on a host computer; or
- through a Smart TV display with a streaming client supporting the associated audiovisual stream format.

The audio/video stream consumer, named VIDEOCONSUMER, will display the HD/4K MP4 or MKV recording streamed from the host computer:

- through a dedicated audio/video stream rendering application associated with the webcam vendor operating on a host computer; or
- through an open audio/video RTSP stream rendering application such as VLC™ or MPC™ operating on a host computer; or
- through a Smart TV display with a streaming client supporting the associated audiovisual stream format.

Networking setup of the tests infrastructure

IP addressing scheme: 172.16.16.0/24

VIDEOSOURCE IP address 172.16.16.10/24

VIDEOSOURCE RTSP Unique Resource Identifier (URI):

Example: rtsp://172.16.16.10 :554/POFPlugtest

VIDEOCONSUMER1 IP address 172.16.16.21/24

VIDEOCONSUMER2 IP address 172.16.16.22/24

HD/4K (HTTP or RTSP) video stream can be generated with VLC™ media streaming:

H.264 MKV Royalty Free HD (1920x1080) video contents can be found:

- http://jell.yfish.us
  - Bit rate 50 Mbps (http://jell.yfish.us/media/jellyfish-50-mbps-hd-h264.mkv)
  - Bit rate 80 Mbps (http://jell.yfish.us/media/jellyfish-80-mbps-hd-h264.mkv)
  - Bit rate 100 Mbps (http://jell.yfish.us/media/jellyfish-100-mbps-hd-h264.mkv)
  - Bit rate 110 Mbps (http://jell.yfish.us/media/jellyfish-110-mbps-hd-h264.mkv)

H.264 MP4 Royalty Free UltraHD (3840x2160) video contents can be found:

- http://jell.yfish.us
  - Bit rate 120 Mbps (http://jell.yfish.us/media/jellyfish-120-mbps-4k-uhd-h264.mkv)
  - Bit rate 200 Mbps (http://jell.yfish.us/media/jellyfish-200-mbps-4k-uhd-h264.mkv)
  - Bit rate 250 Mbps (http://jell.yfish.us/media/jellyfish-250-mbps-4k-uhd-h264.mkv)
- http://4ksamples.com
  - Honey Bees 96fps In 4K (ULTRA HD), Overall bit rate 22,4 Mbps (http://4ksamples.com/honey-bees-96fps-in-4k-ultra-hd)
  - 4K UHD Fireworks Sample, Overall bit rate 95,7 Mbps (http://4ksamples.com/4k-uhd-fireworks-sample/)

If encoding/decoding the video stream through a software application such as VLC™, the processing host computer should be dimensioned accordingly (strong CPU power and sufficient memory).

For extreme network solicitation, an H.265 (High Efficiency Video Coding, HEVC) MKV recording with Bit rate 400 Mbps is also available (http://jell.yfish.us/media/jellyfish-400-mbps-4k-uhd-hevc-10bit.mkv).

POF networking infrastructures such as IEEE 802.3u [i.5] and IEEE 802.3bv [i.7], respectively providing 100 Mbps and 1 Gbps should be capable to handle the heavy traffic without any packets losses. Through an audio/video application, these packet losses appear as pixellation onto the video rendering as well as poor audio quality or non-synced audio/video.

4.2.3 Heavy file transfer service

This application scenario suggests a digital service delivery which consists in the transfer of a large (≥ 5 GB) data file. This one requires:

- either the selection of a networked file transport protocol such as File Transfer Protocol (FTP, IETF RFC 959 [i.16]), Peer to Peer (P2P) such as Torrent;

- either the selection of a networked file sharing protocol such as Common Internet File System (CIFS), Server Message Block (SMB) or Network File System (NFS).

Within the networking administration community, FileZilla is a recognized, cross platform, FTP client providing transfers monitoring capabilities.

Within the networking administration community, Vuze® (Azureus) is a recognized, cross platform, P2P Torrent server/tracker & client providing transfers monitoring capabilities.

The file hosting source, named FILESOURCE, will be served through one of the above transfer technologies.

The data stream consumer, named FILECONSUMER, will be downloaded through a file browser client of the corresponding selected transfer technology.

Networking setup of the tests infrastructure

IP addressing scheme: 172.16.16.0/24

FILESOURCE IP address 172.16.16.10/24

Example: ftp://172.16.16.10:21/LargePOFPlugtestFile

Example: cifs://172.16.16.10:445/LargePOFPlugtestFile

Example: smb://172.16.16.10:445/LargePOFPlugtestFile

Example: nfs://172.16.16.10:2049/LargePOFPlugtestFile

Examples: for Torrent Tracker and for Torrent Magnet

http://172.16.16.10 :6969/torrents/LargePOFPlugtest.torrent?F72BDA24CA20070C650AC9542E3946CB5632503
magnet:?xt=urn:btih:64V5UJGKEADQYZIKZFKC4OKGZNLDEUB3

FILECONSUMER1 IP address 172.16.16.21/24

FILECONSUMER2 IP address 172.16.16.22/24

4.2.4 Network traffic generator service

This application scenario suggests a digital service delivery which consists of traffic generator & monitoring tool. This one requires the setup of an engineered network tool capable of:

- creating Transmission Control Protocol (TCP) or User Datagram Protocol (UDP) data streams; and
- measuring the throughput of the underlying network that is carrying those data streams.

Within the networking administration community, Iperf3 is a recognized, cross platform, tool for active measurements of the maximum achievable bandwidth on an IP network. The networking tool supports tuning of various parameters related to timing, buffers and protocols (TCP, UDP, SCTP with IPv4 and IPv6). For each test, it reports the bandwidth, loss, and other parameters.

The data stream source, named TRAFFICSOURCE, will be generated through an Iperf3 TCP connection generator.

The data stream consumer, named TRAFFICCONSUMER, will be monitored through an Iperf3 TCP connection monitor.

Networking setup of the tests infrastructure

IP addressing scheme: 172.16.16.0/24

TRAFFICSOURCE IP address 172.16.16.10/24

TRAFFICCONSUMER1 IP address 172.16.16.21/24

TRAFFICCONSUMER2 IP address 172.16.16.22/24

TCP networking speed can be tuned through the definition of:

- the TCP window size which depends on the involved Operating Systems (OS) from the two network peers;
- the maximum transmission unit (MTU) which depends the involved Operating Systems (OS) from the two network peers and the underlying layer 1 capabilities across the full network path.

The TCP window size may be as low as 64 KB or as high as several Mb.

In POF Ethernet networking the maximum MTU is 1 500 bytes. Nevertheless, when the host computer does not perform a Path MTU Discovery, default behaviour is often to send and receive small 576 byte packets.

NOTE: TCP/IP header consumes 40 bytes on behind of the data payload therefore the TCP maximum segment size (MSS).

Starting the (very) high speed traffic generator on the TRAFFICSOURCE host computer.

Example (Mbps format, Verbose & Debug mode):

- iperf3 -s -B 172.16.16.10 -p 5201 -f m -V -d
- Starting the (very) high speed traffic consumer on the TRAFFICCONSUMER host computer.

Example running for 60 seconds (TCP windows size of 300k & Maximum Path MTU, Mbps format, Verbose & Debug mode, 10 threads of 100 Mbps to push the networking load):

- iperf3 -c 172.16.16.10 -p 5201 -w 300k -M 1460 -b 100M -f m -V -d -t 60 -P 10

4.3 POF characteristics

POF cable offers a high mechanical tolerance were the 980 um core diameter, with an aperture of 0,5, allows a certain tolerance on the LED-transmitter and LED-receiver alignments. This tolerance avoids the use of expensive precision tool if adding a connector to the wire. Furthermore, this larger core reduces significantly the impact that dust can have at the end of the wire in front of the optical eye aperture.

The plastic material in which POF cable are constituted offers high mechanical resilience: the flexibility of the plastic allows rough manipulation of the fibre, such as severe cable binding, stretching or knotting without causing permanent damages.

The use of a plastic material and the light alignment tolerance authorize to the installation the usage of easy tooling such as conventional scissors and simple polishing method (e.g. sand paper) or simple cutting tool which avoid polishing after cutting. POF cable ends can be with a connector but it is common practice in Home/Consumer cases to deploy the wiring connector-less via various methods of clamping present in recent transceivers. Examples of connector less clamping socket are OptoLock® from Firecomms and OptoClamp from Avago.

For the Ethernet networking, various types of Physical Medium Dependent (PMD) are standardized for POF:

- 100BASE-FX PHY as specified in IEEE 802.3u [i.5]
- 1000BASE-RHx PMDs as specified in IEEE 802.3bv [i.7]:
  - 1000BASE-RHA: specifications for Home/Consumer
  - 1000BASE-RHB: specifications for Industrial applications
  - 1000BASE-RHC: specifications for Automotive applications

POF cable benefits of low bending losses. The 980 um core diameter permits a bending tolerance for which IEEE 802.3bv [i.7] foresees a 0,5 dB loss at speed of 1 Gbps for every bends at 90° with a radius of 25 mm.

Red LED (650 nm) POF transmitter generates light with a nominal optical output power of -3 dBm with an attenuation of 18 dB/100 m without any bend. Whereas green LED (520 nm), required for long fibre distances, POF transmitter generates light with a nominal optical output power from 3 dBm to 6 dBm with an attenuation of 9 dB/100 m without any bend.

The POF cable robustness, its electromagnetic immunity, its galvanic security, and associated building cabling legislations offer the benefit of reuse of the power conduits for the installation of the fibre. Star, tree, daisy chain and mixed topologies are possible. Extended through a daisy chain with a passive in-line connector introduces though an attenuation of 1 dB to 2,5 dB however without any real impact on the bandwidth.

Transmission distances depends of several factors such as POF cable type, light source wavelength, emitting power, losses (e.g. bends, passive in-line connector), digital coding scheme, etc.

Detailed information related to POF media characteristics are presented in ETSI TS 105 174-1-2 [i.4].

The ideal transmission distance for Fast Ethernet connection with red LED is 140 m. Whereas the ideal transmission distance for Gigabit Ethernet connection with red LED is 50 metres.

Recent advances in LED, Vertical Cavity Surface Emitting Laser (VCSEL) and signals modulation (e.g. Pulse-Amplitude Modulation PAM vs simple Non Return to Zero, NRZ) technologies have enabled POF to support data rates of multi Gbps. For the Ethernet networking, current IEEE standards specify only 100 Mbps and 1 000 Mbps data rates.

The POF cable of interest for the present Plugtests is the duplex cable of Step Index plastic optical fibre according to IEC 60793-2-40 sub-category A4a.2 [i.8].

The PMD of interest for the present Plugtests are the non 100BASE-FX PHY & 1000BASE-RHA without a connector at cable extremities.

IEEE 802.3bv [i.7] specifies that the 1000BASE-RHA PMD is coupled to the fibre optic cable through a connection at the Medium Dependent Interface (MDI). The mechanical interface specifies that the 1000BASE-RHA PMD and the associated MDI receptacle are coupled to the prepared fibre optic cabling without a plug. The 1000BASE-RHA MDI receptacle is a duplex housing consisting of two separated slots (transmit and receive). This receptacle has both open and close positions. This later position guarantees a stable and resilient connection by utilizing a retention mechanism with a minimum steady state of retention force 4 Newton.

The LED light source of interest for the present Plugtests is 650 nm red.

Table 1: Optical Power per reach

650 nm red LED with	50 metres	60 metres	80 metres
100 Mbps (NRZ line code) 100BASE-FX PHY PMD IEEE 802.3u [i.5]	Optical Power - dBm	Optical Power - dBm	Optical Power - dBm
1 000 Mbps (PAM line code) 1000BASE-RHA PMD IEEE 802.3bv [i.7]	Optical Power -12,6 dBm	Optical Power -14,9 dBm	Optical Power -17,9 dBm

ETSI TS 105 175-1 [i.2] PMMA POF specifies requirements for 100 Mbps system (max Physical-Layer Data Rate is 125 Mbit/s, compliant with IEEE 802.3u [i.5]).

Table 2: 100 Mbps reach per bending

650 nm red LED	50 metres	75 metres	100 metres
0 (12 mm radius) 90° bend	100 Mbps	100 Mbps	100 Mbps
10 (12 mm radius) 90° bends	100 Mbps	To be determined	To be determined

ETSI TS 105 175-1 [i.2] PMMA POF specifies requirements for 1 Gbps system (max Physical-Layer Data Rate is 125 Mbps, compliant with IEEE 802.3z [i.6]).

Table 3: 1 Gbps reach per bending

650 nm red LED	50 metres	75 metres	100 metres
0 (12 mm radius) 90° bend	1,25 Gbps	0,87 Gbps	0,5 Gbps
10 (12 mm radius) 90° bends	0,85 Gbps	0,45 Gbps	0,08 Gbps

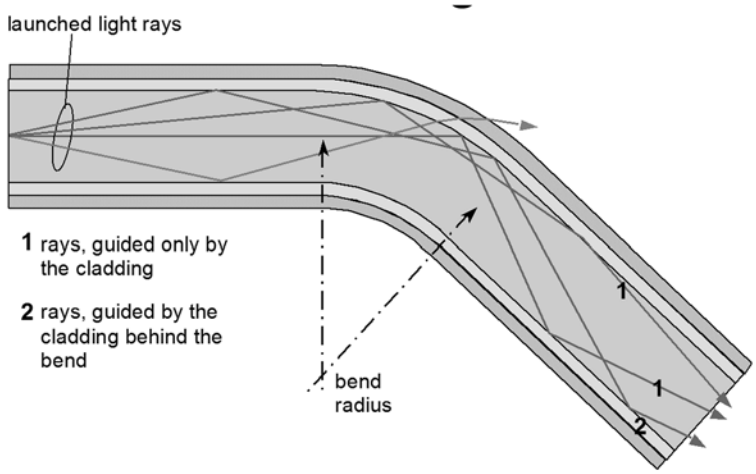

Figure 3: Fibre bending

POF cable wiring with loops where radius is over 25 mm offers an operation situation similar to a straight cable wiring as the introduced loss is insignificant.

4.4 Test Suite Structure (TSS) for POF

4.4.1 Generalities

Passive & semi passive tests:

This category of tests is related to the mechanicals characteristics of the media and the impact of bend losses on the light path. Tests in this category only involve the termination of a single side of the POF cable media with an active POF equipment without involving any Internet Protocol (IP) over Ethernet network host.

A passive POF equipment is from types: patch panel, in-line adaptor.

An active POF equipment is from types: media converter, Ethernet switch.

For the different vendors, the points to verify for raw (whichever cutting tool: e.g. scissor, cutter) and clean (dedicated POF cutter) cut of the plastic fibre to be connected to the PHY interface are:

- Compliancy with MDI: Correct 'easy' insertion of (from 1,5 mm to 2,2 mm diameter) cable into PHY interface.
- Robustness of the clamping.
- Red light emission verification at end of cable for 10, 50 & 100 metres cable lengths on straight paths.
- Red light emission verification at end of cable for 10, 50 & 100 metres cable lengths with (5,10) bends and for 50 metres cable lengths with 30 bends.
- Red light emission verification at end of cable for 10, 50 & 100 metres cable lengths with damage (chew, crush, torsion), without or with an injury on the cable jacket.

NOTE 1: For every 5 bends, the POF cable path is following 2 cable loops and the light direction is rotated 90°.

Semi active tests:

This category of tests is related to the mechanicals characteristics of the media and the impact of bend losses on the light path. Tests in this category involve the termination of a both side of the POF cable media with an active POF equipment without involving any Internet Protocol (IP) over Ethernet network host.

An active POF equipment is from types:

- Ethernet media converter;

- Ethernet switch.

The semi active tests are interconnecting two pieces of equipment:

- with cable lengths of 10, 50 & 100 metres:
  - on straight paths;
  - on straight paths with (5,10) bends;
  - on straight paths with damage (chew, crush, torsion), without an injury on the cable jacket.
- with cable length of 50 metres:
  - on straight path with 30 bends;
  - on straight paths with damage (chew, crush, torsion), with an injury on the cable jacket.

NOTE 2: For every 5 bends, the POF cable path is following 2 cable loops and the light direction is rotated 90°.

The link can associate peer types (Ethernet media converter or Ethernet switch) from the same speed interface category:

- two mono speed interfaces at 100 Mbps;
- two mono speed interfaces at 1 Gbps;
- two dual speed interfaces at 100 Mbit/Gbps.

These peer possibilities are represented by 'S' in table 4.

The link cannot combine peer types (Ethernet media converter or Ethernet switch) from different speed interfaces categories if both peers are mono speed interface:

- one mono speed interface at 100 Mbps with one mono speed interfaces at 1 Gbps.

Incompatible peers possibilities are represented by 'I' in table 4.

The link can combine peer types (Ethernet media converter or Ethernet switch) from different speed interfaces categories if one of the peer is dual speed interface:

- one mono speed interface at 100 Mbps with one dual speed interface at 100 Mbps/1 Gbps;
- one mono speed interface at 1 Gbps with one dual speed interface at 100 Mbps/1 Gbps.

NOTE 3: For dual mode 100 Mbps/1 Gbps interfaces, depending on the vendor's backward compatibility implementation for the line coding, traffic flows between 100 Mbps only equipment's connected to such dual speed interfaces may not be operational resulting therefore in an incompatible association ('I' in table 4).

These peer possibilities are represented by 'D' in table 4.

Table 4: POF link peer types matrix

	Media converter 100 Mbps	Media converter 1 Gbps	Media converter 100 Mbps/1 Gbps	POF switch 100 Mbps	POF switch 1 Gbps	POF switch 100 Mbps/1 Gbps
Media converter 100 Mbps	S	I	D/I	S	I	D/I
Media converter 1 Gbps		S	D/I	I	S	D/I
Media converter 100 Mbps/1 Gbps			S	D/I	D/I	S
POF switch 100 Mbps				S	I	D/I
POF switch 1 Gbps					S	D/I
POF switch 100 Mbps/1 Gbps						S

Points to verify:

- Compliancy of the Auto MDI (sync status) of the POF interfaces of the two equipment for 10, 50 & 100 metres cable lengths on straight paths.
- Compliancy of the Auto MDI (sync status) of the POF interfaces of the two equipment for 10, 50 & 100 metres cable lengths with (5,10) bends and for 50 metres cable length with 30 bends.
- Compliancy of the Auto MDI (sync status) of the POF interfaces of the two equipment for 10, 50 & 100 metres cable lengths with damage (chew, crush, torsion), without an injury on the cable jacket and for 50 metres cable length with an injury on the cable jacket.
- For media converter, the POF operational interface link status should propagate the Ethernet copper port operational links status and vice versa.

NOTE 4: For every 5 bends, the POF cable path is following 2 cable loops and the light direction is rotated 90°.

Active tests:

This category of tests is related to the operational impact of the media performances in various conditions (cable length, bend losses) on the application scenario defined in clause 4.1. Tests in this category involve the termination of both sides of the POF cable media with an active POF equipment enabling one or more Internet Protocol (IP) over Ethernet network host to perform the application scenario.

An active POF equipment is from types: media converter, Ethernet switch.

A test network host is a computing system which connected through Ethernet to the Plugtests POF network and which operates a TCP/IP stack and the software applications associated with the applications scenarios describes in clause 4.2.

For 'S' & 'D' POF peer types operating application scenarios 1, 2, 3 with:

- with cable lengths of 10, 50 & 100 metres:
  - on straight paths;
  - on straight paths with (5,10) bends;
  - on straight paths with damage (chew, crush, torsion), without an injury on the cable jacket.
- with cable length of 50 metres:
  - on straight path with 30 bends;
  - on straight paths with damage (chew, crush, torsion), with an injury on the cable jacket.

NOTE 5: For every 5 bends, the POF cable path is following 2 cable loops and the light direction is rotated 90°.

Points to verify:

- Verifying the underlying IP networking infrastructure setup through 'ping' requests from the involved hosts of the application scenario.
- Running the application scenarios:
  - scenario 1: subjective audio visual quality;
  - scenario 2: data metrics of the file transfer;
  - scenario 3: data metrics of the network performance solicitation.
- The behaviours of the running operations for the various cable lengths on straight paths.
- The behaviours of the running operations for the loss introductions with (5, 10, 30) bends.
  Impact of POF cable damage (chew, crush, torsion), without or with an injury on the cable jacket, on the application scenarios (no impact, impact on the application, application breaks).
- The behaviours of the running operations in recovering after the introductions of a brief link loss (unplug/plug cable).

The specifications of these POF Plugtests tests are expressed in clause 4.5 through a notation like the Testing and Test Control Notation version 3 (TTCN-3) [i.10] and associated Test Suite Structure & Test Purposes [i.11].

4.4.2 Test Suite Structure & Test Purposes

Various type of testing can be achieved on the POF technology. For the clarity of the Plugtests, these tests are organized in structured groups and a description of a well-defined object for each test is specified and referred as a Test Purpose (TP).

The organization of these TP into such structured groups is referred as "Test Suite Structure" (TSS). The definition of the TP is the output of the analysis of the requirements and specification which are expressed in the standards governing the POF operation for Ethernet networking.

4.4.3 Test Purposes (TP) definition conventions

A Test Purpose represents a clear definition of a test objective. It presents the initial condition in which performing the test, the expected behaviour of the execution of the test and the final condition in which the test should result. For the clarity of the Plugtests, a template is provided in table 5.

Table 5: TP template

TP ID	
Test objective	
Initial situation	
Expected behaviour	
Final situation	

The description of elements of the template is presented in table 6.

Table 6: TP definition rules

TP Header	
TP ID	The TP ID is a unique identifier. It is specified according to the TP naming conventions defined in clause 4.4.4.
Test objective	Short description of test purpose objective according to the targeted situation of the POF feature to experiment.
TP Behaviour	
Initial situation	The Initial situation define in which initial state the POF infrastructure should be prepared to apply the actual TP.
Expected behaviour	Definition of the actions, which are parts of the TP objective, on the POF infrastructure entities which are expected to be performed to verify the conformity of the POF networking capabilities.
Final situation	Definition of the situation that the POF infrastructure is expected to reach or not, according to the POF networking capabilities and following the correct execution of the actions in the expected behaviour above.

4.4.4 TP identifier naming conventions

The TP identifier identifies uniquely the test purposes. To ensure the uniqueness of the TP identifier, it follows a naming convention.

The structure of the identifier for the POF TP built in 3 groups, 3 subgroups and 2 types of testing is presented in table 7. The TP identifier is formed by the abbreviation "TP", followed by abbreviation representing the group of the following TSS levels, ending with a number representing the TP instance. Each field of the TP identifier is separated by a "/".

Table 7: TP naming convention

Identifier:	**TP/<root>/<gr>/<sgr>/<x>/<nn>**		
	<root> = root	POF	
	<gr> = group	PSPT	Passive & semi-passive tests
		SAT	Semi-active tests
		AT	Active tests
	<sgr> = subgroup	PCOMPONENT	Passive component
		ACOMPONENT	Active component
		MEDIA	Cable media
	<x> = type of testing	BV	Valid Behaviour Tests
		BI	Invalid Behaviour Tests
	<nn> = sequential number		01 to 99

A TP identifier, following this TP naming convention of the table could be TP/POF/AT/MEDIA/BV/01.

The TP numbering uses two digits for presentation, and starts with 01 rather than with 00. Exceeding 99 TPs per group is not recommended. In such a case, it is rather recommended to create sub-groups, to keep clarity in the Test Suite Structure.

4.5 POF tests

4.5.1 POF passive & semi-passive tests

4.5.1.0 Passive & semi-passive categories

This category of tests is related to the mechanicals characteristics of the media and the impact of bend losses on the light path. Tests in this category only involve:

- the termination of a single side of the POF cable media;
- with either a passive or an active POF equipment;
- without involving any Internet Protocol (IP) over Ethernet network host.

Tests investigations in this category are realized through visual observations of both mechanical and optical behaviours.

A passive POF equipment is from types: fibre patch panel, fibre in-line adaptor.

An active POF equipment is from types: Ethernet media converter, Ethernet switch.

4.5.1.1 PASSIVE - TP/POF/PSPT/PCOMPONENT/BV

TP ID	TP/POF/PSPT/PCOMPONENT/BV/01
Test objective	Verifying mechanical POF cable dimension (diameter) compliance with MDI physical interface and vice versa as well as the correct clamping conditions for passive equipment when the cable is cut with a regular cutting tool.
Initial situation	
POF cable cut with a scissor or a cutter. A POF cable segment of 1 metre minimum with fibre diameter (including jacket) included between 1,5 and 2,2 mm. A POF passive equipment with connector less MDI interface.	
Expected behaviour	
Connecting the POF cable to the equipment MDI interface. POF cable raw cut should not impact the mechanical connection between the media and the MDI interface. POF cable should easily be inserted into the connector less MDI interface. POF cable manipulation near the connector less MDI interface should not have any impact on clampings' strength.	
Final situation	
POF cable should be appropriately inserted and hold with the clamping mechanism of the MDI interface of the passive equipment.	

TP ID	TP/POF/PSPT/PCOMPONENT/BV/02
Test objective	Verifying mechanical POF cable dimension (diameter) compliance with MDI physical interface and vice versa as well as the correct clamping conditions for a passive equipment when the cable is cut with a dedicated cutting tool.
Initial situation	
POF cable cut with a dedicated cutting tool. A POF cable segment of 1 metre minimum with fibre diameter (including jacket) included between 1,5 and 2,2 mm. A POF passive equipment with connector less MDI interface.	
Expected behaviour	
Connecting the POF cable to the equipment MDI interface. POF cable should easily be inserted into the connector less MDI interface. POF cable manipulation near the connector less MDI interface should not have any impact on clampings' strength.	
Final situation	
POF cable should be appropriately inserted and hold with the clamping mechanism of the MDI interface of the passive equipment.	

4.5.1.2 PASSIVE - TP/POF/PSPT/PCOMPONENT/BI

TP ID	TP/POF/PSPT/PCOMPONENT/BI/01
Test objective	Verifying mechanical impact of incorrect POF cable coupling with MDI physical interface for a passive equipment.
Initial situation	
POF cable cut with a dedicated cutting tool. A POF cable segment of 1 metre minimum with fibre diameter (including jacket) included between 1,5 and 2,2 mm. A POF passive equipment with connector less MDI interface.	
Expected behaviour	
Connecting the POF cable to the equipment MDI interface. POF cable should easily be inserted into the connector less MDI interface. POF cable introduction into the MDI interface should be realized without complete insertion. POF cable manipulation near the connector less MDI interface should have some impacts on clampings' strength.	
Final situation	
POF cable should be inappropriately inserted and the clamping mechanism of the MDI interface should not be tight on the passive equipment.	

4.5.1.3 PASSIVE - TP/POF/PSPT/ACOMPONENT/BV

TP ID	TP/POF/PSPT/ACOMPONENT/BV/01
Test objective	Verifying mechanical POF cable dimension (diameter) compliance with MDI physical interface and vice versa as well as the correct clamping conditions for an active equipment when the cable is cut with a regular cutting tool.
Initial situation	
POF cable cut with a scissor or a cutter. A POF cable segment, length of 1 metre minimum, with fibre diameter (including jacket) included between 1,5 and 2,2 mm. A POF active equipment with connector less MDI interface.	
Expected behaviour	
Connecting the POF cable to the equipment MDI interface. POF cable should easily be inserted into the connector less MDI interface. POF cable raw cut should not impact the mechanical connection between the media and the MDI interface. POF cable manipulation near the connector less MDI interface should not have any impact on clampings' strength.	
Final situation	
POF cable should be appropriately inserted and hold with the clamping mechanism of the MDI interface of the active equipment.	

TP ID	TP/POF/PSPT/ACOMPONENT/BV/02
Test objective	Verifying mechanical POF cable dimension (diameter) compliance with MDI physical interface and vice versa as well as the correct clamping conditions for an active equipment when the cable is cut with a POF cutting tool.
Initial situation	
POF cable cut with a dedicated cutting tool. A POF cable segment, length of 1 metre minimum, with fibre diameter (including jacket) included between 1,5 and 2,2 mm. A POF active equipment with connector less MDI interface.	
Expected behaviour	
Connecting the POF cable to the equipment MDI interface. POF cable should easily be inserted into the connector less MDI interface. POF cable manipulation near the connector less MDI interface should not have any impact on clampings' strength.	
Final situation	
POF cable should be appropriately inserted and hold with the clamping mechanism of the MDI interface of the active equipment.	

4.5.1.4 PASSIVE - TP/POF/PSPT/ACOMPONENT/BI

TP ID	TP/POF/PSPT/ACOMPONENT/BI/01
Test objective	Verifying mechanical impact of incorrect POF cable coupling with MDI physical interface for an active equipment.
Initial situation	
POF cable cut with a dedicated cutting tool. A POF cable segment, length of 1 metre minimum, with fibre diameter (including jacket) included between 1,5 and 2,2 mm. A POF active equipment with connector less MDI interface.	
Expected behaviour	
Connecting the POF cable to the equipment MDI interface. POF cable should easily be inserted into the connector less MDI interface. POF cable introduction into the MDI interface should be realized without complete insertion. POF cable manipulation near the connector less MDI interface should have some impacts on clampings' strength.	
Final situation	
POF cable should be inappropriately inserted and the clamping mechanism of the MDI interface should not be tight on the active equipment.	

4.5.1.5 SEMI PASSIVE - TP/POF/PSPT/ACOMPONENT/BV

=no bending=

TP ID	TP/POF/PSPT/ACOMPONENT/BV/03
Test objective	Verifying optical impact of POF cable MDI physical interface clamping on light transmission through the fibre with a length of 10 metres without any bends when the cable is cut with a regular cutting tool.
Initial situation	
POF cable cut with a scissor or a cutter. A POF cable segment of 10 metres with fibre diameter (including jacket) included between 1,5 and 2,2 mm. A setup with straight wires without any bends. A POF active equipment (media converter or Ethernet switch) with connector less MDI interface.	
Expected behaviour	
Connecting the POF cable to the equipment MDI interface. POF cable raw cut should not impact the light signal transmission between the optical LED transceiver and the media. Manipulating the POF cable near the connector less MDI interface should not have any impact light transmission at the other extremity of the cable.	
Final situation	
Red Light observation on the unconnected extremity of the POF cable should stay visible without interruption and provides the same visual lightning conditions.	

TP ID	TP/POF/PSPT/ACOMPONENT/BV/04
Test objective	Verifying optical impact of POF cable MDI physical interface clamping on light transmission through the fibre with a length of 10 metres without any bends when the cable is cut with a POF cutting tool.
Initial situation	
Cutting the POF cable with a dedicated cutting tool. A POF cable segment of 10 metres with fibre diameter (including jacket) included between 1,5 and 2,2 mm. A setup with straight wires without any bends. A POF active equipment (media converter or Ethernet switch) with connector less MDI interface.	
Expected behaviour	
Connecting the POF cable to the equipment MDI interface. Manipulating the POF cable near the connector less MDI interface should not have any impact light transmission at the other extremity of the cable.	
Final situation	
Red Light observation on the unconnected extremity of the POF cable should stay visible without interruption and provides the same visual lightning conditions.	

TP ID	TP/POF/PSPT/ACOMPONENT/BV/05
Test objective	Verifying optical impact of POF cable MDI physical interface clamping on light transmission through the fibre with a length of 50 metres without any bends when the cable is cut with a regular cutting tool.
Initial situation	
POF cable cut with a scissor or a cutter. A POF cable segment of 50 metres with fibre diameter (including jacket) included between 1,5 and 2,2 mm. A setup with straight wires without any bends. A POF active equipment (media converter or Ethernet switch) with connector less MDI interface.	
Expected behaviour	
Connecting the POF cable to the equipment MDI interface. POF cable raw cut should not impact the light signal transmission between the optical LED transceiver and the media Manipulating the POF cable near the connector less MDI interface should not have any impact light transmission at the other extremity of the cable.	
Final situation	
Red Light observation on the unconnected extremity of the POF cable should stay visible without interruption and provides the same visual lightning conditions.	

TP ID	TP/POF/PSPT/ACOMPONENT/BV/06
Test objective	Verifying optical impact of POF cable MDI physical interface clamping on light transmission through the fibre with a length of 50 metres without any bends when the cable is cut with a POF cutting tool.
Initial situation	
Cutting the POF cable with a dedicated cutting tool. A POF cable segment of 50 metres with fibre diameter (including jacket) included between 1,5 and 2,2 mm. A setup with straight wires without any bends. A POF active equipment (media converter or Ethernet switch) with connector less MDI interface.	
Expected behaviour	
Connecting the POF cable to the equipment MDI interface. Manipulating the POF cable near the connector less MDI interface should not have any impact light transmission at the other extremity of the cable.	
Final situation	
Red Light observation on the unconnected extremity of the POF cable should stay visible without interruption and provides the same visual lightning conditions.	

TP ID	TP/POF/PSPT/ACOMPONENT/BV/07
Test objective	Verifying optical impact of POF cable MDI physical interface clamping on light transmission through the fibre with a length of 100 m without any bends when the cable is cut with a regular cutting tool.
Initial situation	
POF cable cut with a scissor or a cutter. A POF cable segment of 100 metres with fibre diameter (including jacket) included between 1,5 and 2,2 mm. A setup with straight wires without any bends. A POF active equipment (media converter or Ethernet switch) with connector less MDI interface.	
Expected behaviour	
Connecting the POF cable to the equipment MDI interface. POF cable raw cut should not impact the light signal transmission between the optical LED transceiver and the media. Manipulating the POF cable near the connector less MDI interface should not have any impact light transmission at the other extremity of the cable.	
Final situation	
Red Light observation on the unconnected extremity of the POF cable should stay visible without interruption and provides the same visual lightning conditions.	

TP ID	TP/POF/PSPT/ACOMPONENT/BV/08
Test objective	Verifying optical impact of POF cable MDI physical interface clamping on light transmission through the fibre with a length of 100 metres without any bends when the cable is cut with a POF cutting tool.
Initial situation	
POF cable cut with a dedicated cutting tool. A POF cable segment of 100 metres with fibre diameter (including jacket) included between 1,5 and 2,2 mm. A setup with straight wires without any bends. A POF active equipment (media converter or Ethernet switch) with connector less MDI interface.	
Expected behaviour	
Connecting the POF cable to the equipment MDI interface. Manipulating the POF cable near the connector less MDI interface should not have any impact light transmission at the other extremity of the cable.	
Final situation	
Red Light observation on the unconnected extremity of the POF cable should stay visible without interruption and provides the same visual lightning conditions.	

4.5.1.6 SEMI PASSIVE - TP/POF/PSPT/MEDIA/BV

=bending=

TP ID	TP/POF/PSPT/MEDIA/BV/01
Test objective	Verifying optical impact of cable bends across the POF cable on light transmission through the fibre with a length of 10 metres with 5 bends when the cable is cut with a regular cutting tool.
Initial situation	
POF cable cut with a scissor or a cutter. A POF cable segment of 10 metres with fibre diameter (including jacket) included between 1,5 and 2,2 mm. A setup with straight wires with 5 bends (2,5 loops). Bends should be of radius 12 mm. All bends should have the same diameter. A POF active equipment (media converter or Ethernet switch) with connector less MDI interface.	
Expected behaviour	
Connecting the POF cable to the equipment. POF cable raw cut should not impact the light signal transmission between the optical LED transceiver and the media Inserting 5 bends across the POF cable path should still permit the light transmission at the other extremity of the cable.	
Final situation	
Red Light observation on the unconnected extremity of the POF cable should stay visible without interruption and provides the same visual lightning conditions.	

TP ID	TP/POF/PSPT/MEDIA/BV/02
Test objective	Verifying optical impact of cable bends across the POF cable on light transmission through the fibre with a length of 10 metres with 5 bends when the cable is cut with a POF cutting tool.
Initial situation	
POF cable cut with a dedicated cutting tool. A POF cable segment of 10 metres with fibre diameter (including jacket) included between 1,5 and 2,2 mm. A setup with straight wires with 5 bends (2,5 loops). Bends should be of radius 12 mm. All bends should have the same diameter. A POF active equipment (media converter or Ethernet switch) with connector less MDI interface.	
Expected behaviour	
Connecting the POF cable to the equipment MDI interface. Inserting 5 bends across the POF cable path should still permit the light transmission at the other extremity of the cable.	
Final situation	
Red Light observation on the unconnected extremity of the POF cable should stay visible without interruption and provides the same visual lightning conditions.	

TP ID	TP/POF/PSPT/MEDIA/BV/03
Test objective	Verifying optical impact of cable bends across the POF cable on light transmission through the fibre with a length of 50 metres with 5 bends when the cable is cut with a regular cutting tool.
Initial situation	
POF cable cut with a scissor or a cutter. A POF cable segment of 50 metres with fibre diameter (including jacket) included between 1,5 and 2,2 mm. A setup with straight wires with 5 bends (2,5 loops). Bends should be of radius 12 mm. All bends should have the same diameter. A POF active equipment (media converter or Ethernet switch) with connector less MDI interface.	
Expected behaviour	
Connecting the POF cable to the equipment MDI interface. POF cable raw cut should not impact the light signal transmission between the optical LED transceiver and the media. Inserting 5 bends across the POF cable path should still permit the light transmission at the other extremity of the cable.	
Final situation	
Red Light observation on the unconnected extremity of the POF cable should stay visible without interruption and provides the same visual lightning conditions.	

TP ID	TP/POF/PSPT/MEDIA/BV/04
Test objective	Verifying optical impact of cable bends across the POF cable on light transmission through the fibre with a length of 50 metres with 5 bends when the cable is cut with a POF cutting tool.
Initial situation	
POF cable cut with a dedicated cutting tool. A POF cable segment of 50 metres with fibre diameter (including jacket) included between 1,5 and 2,2 mm. A setup with straight wires with 5 bends (2,5 loops). Bends should be of radius 12 mm. All bends should have the same diameter. A POF active equipment (media converter or Ethernet switch) with connector less MDI interface.	
Expected behaviour	
Connecting the POF cable to the equipment MDI interface. Inserting 5 bends across the POF cable path should still permit the light transmission at the other extremity of the cable.	
Final situation	
Red Light observation on the unconnected extremity of the POF cable should stay visible without interruption and provides the same visual lightning conditions.	

TP ID	TP/POF/PSPT/MEDIA/BV/05
Test objective	Verifying optical impact of cable bends across the POF cable on light transmission through the fibre with a length of 100 metres with 5 bends when the cable is cut with a regular cutting tool.
Initial situation	
POF cable cut with a scissor or a cutter. A POF cable segment of 100 metres with fibre diameter (including jacket) included between 1,5 and 2,2 mm. A setup with straight wires with 5 bends (2,5 loops). Bends should be of radius 12 mm. All bends should have the same diameter. A POF active equipment (media converter or Ethernet switch) with connector less MDI interface.	
Expected behaviour	
Connecting the POF cable to the equipment MDI interface. POF cable raw cut should not impact the light signal transmission between the optical LED transceiver and the media Inserting 5 bends across the POF cable path should still permit the light transmission at the other extremity of the cable.	
Final situation	
Red Light observation on the unconnected extremity of the POF cable should stay visible without interruption and provides the same visual lightning conditions.	

TP ID	TP/POF/PSPT/MEDIA/BV/06
Test objective	Verifying optical impact of cable bends across the POF cable on light transmission through the fibre with a length of 100 metres with 5 bends when the cable is cut with a dedicated cutting tool.
Initial situation	
POF cable cut with a dedicated cutting tool. A POF cable segment of 100 metres with fibre diameter (including jacket) included between 1,5 and 2,2 mm. A setup with straight wires with 5 bends (2,5 loops). Bends should be of radius 12 mm. All bends should have the same diameter. A POF active equipment (media converter or Ethernet switch) with connector less MDI interface.	
Expected behaviour	
Connecting the POF cable to the equipment MDI interface. Inserting 5 bends across the POF cable path should still permit the light transmission at the other extremity of the cable.	
Final situation	
Red Light observation on the unconnected extremity of the POF cable should stay visible without interruption and provides the same visual lightning conditions.	

TP ID	TP/POF/PSPT/MEDIA/BV/07
Test objective	Verifying optical impact of cable bends across the POF cable on light transmission through the fibre with a length of 10 metres with 10 bends when the cable is cut with a regular cutting tool.
Initial situation	
POF cable cut with a scissor or a cutter. A POF cable segment of 10 metres with fibre diameter (including jacket) included between 1,5 and 2,2 mm. A setup with straight wires with 10 bends (5 loops). Bends should be of radius 12 mm. All bends should have the same diameter. A POF active equipment (media converter or Ethernet switch) with connector less MDI interface.	
Expected behaviour	
Connecting the POF cable to the equipment MDI interface. POF cable raw cut should not impact the light signal transmission between the optical LED transceiver and the media. Inserting 10 bends across the POF cable path should still permit the light transmission at the other extremity of the cable.	
Final situation	
Red Light observation on the unconnected extremity of the POF cable should stay visible without interruption and provides the same visual lightning conditions.	

TP ID	TP/POF/PSPT/MEDIA/BV/08
Test objective	Verifying optical impact of cable bends across the POF cable on light transmission through the fibre with a length of 10 metres with 10 bends when the cable is cut with a POF cutting tool.
Initial situation	
POF cable cut with a dedicated cutting tool. A POF cable segment of 10 metres with fibre diameter (including jacket) included between 1,5 and 2,2 mm. A setup with straight wires with 10 bends (5 loops). Bends should be of radius 12 mm. All bends should have the same diameter. A POF active equipment (media converter or Ethernet switch) with connector less MDI interface.	
Expected behaviour	
Connecting the POF cable to the equipment MDI interface. Inserting 10 bends across the POF cable path should still permit the light transmission at the other extremity of the cable.	
Final situation	
Red Light observation on the unconnected extremity of the POF cable should stay visible without interruption and provides the same visual lightning conditions.	

TP ID	TP/POF/PSPT/MEDIA/BV/09
Test objective	Verifying optical impact of cable bends across the POF cable on light transmission through the fibre with a length of 50 metres with 10 bends when the cable is cut with a regular cutting tool.
Initial situation	
POF cable cut with a scissor or a cutter. A POF cable segment of 50 metres with fibre diameter (including jacket) included between 1,5 and 2,2 mm. A setup with straight wires with 10 bends (5 loops). Bends should be of radius 12 mm. All bends should have the same diameter. A POF active equipment (media converter or Ethernet switch) with connector less MDI interface.	
Expected behaviour	
Connecting the POF cable to the equipment MDI interface. POF cable raw cut should not impact the light signal transmission between the optical LED transceiver and the media Inserting 10 bends across the POF cable path should still permit the light transmission at the other extremity of the cable.	
Final situation	
Red Light observation on the unconnected extremity of the POF cable should stay visible without interruption and provides the same visual lightning conditions.	

TP ID	TP/POF/PSPT/MEDIA/BV/10
Test objective	Verifying optical impact of cable bends across the POF cable on light transmission through the fibre with a length of 50 metres with 10 bends when the cable is cut with a POF cutting tool.
Initial situation	
POF cable cut with a dedicated cutting tool. A POF cable segment of 50 metres with fibre diameter (including jacket) included between 1,5 and 2,2 mm. A setup with straight wires with 10 bends (5 loops). Bends should be of radius 12 mm. All bends should have the same diameter. A POF active equipment (media converter or Ethernet switch) with connector less MDI interface.	
Expected behaviour	
Connecting the POF cable to the equipment MDI interface. Inserting 10 bends across the POF cable path should still permit the light transmission at the other extremity of the cable.	
Final situation	
Red Light observation on the unconnected extremity of the POF cable should stay visible without interruption and provides the same visual lightning conditions.	

TP ID	TP/POF/PSPT/MEDIA/BV/11
Test objective	Verifying optical impact of cable bends across the POF cable on light transmission through the fibre with a length of 100 metres with 10 bends when the cable is cut with a regular cutting tool.
Initial situation	
POF cable cut with a scissor or a cutter. A POF cable segment of 100 metres with fibre diameter (including jacket) included between 1,5 and 2,2 mm. A setup with straight wires with 10 bends (5 loops). Bends should be of radius 12 mm. All bends should have the same diameter. A POF active equipment (media converter or Ethernet switch) with connector less MDI interface.	
Expected behaviour	
Connecting the POF cable to the equipment MDI interface. POF cable raw cut should not impact the light signal transmission between the optical LED transceiver and the media Inserting 10 bends across the POF cable path should still permit the light transmission at the other extremity of the cable.	
Final situation	
Red Light observation on the unconnected extremity of the POF cable should stay visible without interruption and provides the same visual lightning conditions.	

TP ID	TP/POF/PSPT/MEDIA/BV/12
Test objective	Verifying optical impact of cable bends across the POF cable on light transmission through the fibre with a length of 100 m with 10 bends when the cable is cut with a POF cutting tool.
Initial situation	
Cutting the POF cable with a dedicated cutting tool. A POF cable segment of 100 metres with fibre diameter (including jacket) included between 1,5 and 2,2 mm. A setup with straight wires with 10 bends (5 loops). Bends should be of radius 12 mm. All bends should have the same diameter. A POF active equipment (media converter or Ethernet switch) with connector less MDI interface.	
Expected behaviour	
Connecting the POF cable to the equipment MDI interface. Inserting 10 bends across the POF cable path should still permit the light transmission at the other extremity of the cable.	
Final situation	
Red Light observation on the unconnected extremity of the POF cable should stay visible without interruption and provides the same visual lightning conditions.	

=damage; no injury=

TP ID	TP/POF/PSPT/MEDIA/BV/13
Test objective	Verifying optical impact of POF cable MDI physical interface clamping on light transmission through the fibre with a length of 10 metres without any bends when the cable is cut with a regular cutting tool when POF cable is damaged (chew, crush or torsion without an injury to the cable jacket).
Initial situation	
POF cable cut with a scissor or a cutter. Correct coupling of the POF cable with the MDI interface clamping. A POF cable segment of 10 metres with fibre diameter (including jacket) included between 1,5 and 2,2 mm. A setup with straight wires without any bends. A POF active equipment (media converter or Ethernet switch) with connector less MDI interface.	
Expected behaviour	
Connecting the POF cable to the equipment MDI interface. Setup the operation with a damage without an injury on the POF cable: firmly chew, crush or apply a strong torsion the cable anywhere without breaking the cable jacket (not making the fibre core visible). POF cable raw cut should not impact the light signal transmission between the optical LED transceiver and the media Damage to the POF cable do not have any impact light transmission at the other extremity of the cable.	
Final situation	
Red Light observation on the unconnected extremity of the POF cable should stay visible without interruption and provides the same visual lightning conditions.	

TP ID	TP/POF/PSPT/MEDIA/BV/14
Test objective	Verifying optical impact of POF cable MDI physical interface clamping on light transmission through the fibre with a length of 10 metres without any bends when the cable is cut with a POF cutting tool when POF cable is damaged (chew, crush or torsion without an injury to the cable jacket).
Initial situation	
Cutting the POF cable with a dedicated cutting tool. A POF cable segment of 10 metres with fibre diameter (including jacket) included between 1,5 and 2,2 mm. A setup with straight wires without any bends. A POF active equipment (media converter or Ethernet switch) with connector less MDI interface.	
Expected behaviour	
Connecting the POF cable to the equipment MDI interface. Setup the operation with a damage without an injury on the POF cable: firmly chew, crush or apply a strong torsion the cable anywhere without breaking the cable jacket (not making the fibre core visible). Damage to the POF cable do not have any impact light transmission at the other extremity of the cable.	
Final situation	
Red Light observation on the unconnected extremity of the POF cable should stay visible without interruption and provides the same visual lightning conditions.	

TP ID	TP/POF/PSPT/MEDIA/BV/15
Test objective	Verifying optical impact of POF cable MDI physical interface clamping on light transmission through the fibre with a length of 50 metres without any bends when the cable is cut with a regular cutting tool when POF cable is damaged (chew, crush or torsion without an injury to the cable jacket).
Initial situation	
POF cable cut with a scissor or a cutter. A POF cable segment of 50 metres with fibre diameter (including jacket) included between 1,5 and 2,2 mm. A setup with straight wires without any bends. A POF active equipment (media converter or Ethernet switch) with connector less MDI interface.	
Expected behaviour	
Connecting the POF cable to the equipment MDI interface. Setup the operation with a damage without an injury on the POF cable: firmly chew, crush or apply a strong torsion the cable anywhere without breaking the cable jacket (not making the fibre core visible). POF cable raw cut should not impact the light signal transmission between the optical LED transceiver and the media Damage to the POF cable do not have any impact light transmission at the other extremity of the cable.	
Final situation	
Red Light observation on the unconnected extremity of the POF cable should stay visible without interruption and provides the same visual lightning conditions.	

TP ID	TP/POF/PSPT/MEDIA/BV/16
Test objective	Verifying optical impact of POF cable MDI physical interface clamping on light transmission through the fibre with a length of 50 metres without any bends when the cable is cut with a POF cutting tool when POF cable is damaged (chew, crush or torsion without an injury to the cable jacket).
Initial situation	
Cutting the POF cable with a dedicated cutting tool. A POF cable segment of 50 metres with fibre diameter (including jacket) included between 1,5 and 2,2 mm. A setup with straight wires without any bends. A POF active equipment (media converter or Ethernet switch) with connector less MDI interface.	
Expected behaviour	
Connecting the POF cable to the equipment MDI interface. Setup the operation with a damage without an injury on the POF cable: firmly chew, crush or apply a strong torsion the cable anywhere without breaking the cable jacket (not making the fibre core visible). POF cable raw cut should not impact the light signal transmission between the optical LED transceiver and the media Damage to the POF cable do not have any impact light transmission at the other extremity of the cable.	
Final situation	
Red Light observation on the unconnected extremity of the POF cable should stay visible without interruption and provides the same visual lightning conditions.	

TP ID	TP/POF/PSPT/MEDIA/BV/17
Test objective	Verifying optical impact of POF cable MDI physical interface clamping on light transmission through the fibre with a length of 100 metres without any bends when the cable is cut with a regular cutting tool when POF cable is damaged (chew, crush or torsion without an injury to the cable jacket).
Initial situation	
POF cable cut with a scissor or a cutter. A POF cable segment of 100 metres with fibre diameter (including jacket) included between 1,5 and 2,2 mm. A setup with straight wires without any bends. A POF active equipment (media converter or Ethernet switch) with connector less MDI interface.	
Expected behaviour	
Connecting the POF cable to the equipment MDI interface. Setup the operation with a damage without an injury on the POF cable: firmly chew, crush or apply a strong torsion the cable anywhere without breaking the cable jacket (not making the fibre core visible). POF cable raw cut should not impact the light signal transmission between the optical LED transceiver and the media Damage to the POF cable do not have any impact light transmission at the other extremity of the cable.	
Final situation	
Red Light observation on the unconnected extremity of the POF cable should stay visible without interruption and provides the same visual lightning conditions.	

TP ID	TP/POF/PSPT/MEDIA/BV/18
Test objective	Verifying optical impact of POF cable MDI physical interface clamping on light transmission through the fibre with a length of 100 metres without any bends when the cable is cut with a POF cutting tool when POF cable is damaged (chew, crush or torsion without an injury to the cable jacket).
Initial situation	
Cutting the POF cable with a dedicated cutting tool. A POF cable segment of 100 metres with fibre diameter (including jacket) included between 1,5 and 2,2 mm. A setup with straight wires without any bends. A POF active equipment (media converter or Ethernet switch) with connector less MDI interface.	
Expected behaviour	
Connecting the POF cable to the equipment MDI interface. Setup the operation with a damage without an injury on the POF cable: firmly chew, crush or apply a strong torsion the cable anywhere without breaking the cable jacket (not making the fibre core visible). POF cable raw cut should not impact the light signal transmission between the optical LED transceiver and the media Damage to the POF cable do not have any impact light transmission at the other extremity of the cable.	
Final situation	
Red Light observation on the unconnected extremity of the POF cable should stay visible without interruption and provides the same visual lightning conditions.	

4.5.1.7 SEMI PASSIVE - TP/POF/PSPT/MEDIA/BI

=no bending=

TP ID	TP/POF/PSPT/MEDIA/BI/01
Test objective	Verifying optical impact of incorrect POF cable coupling with MDI physical interface for an active equipment.
Initial situation	
POF cable cut with a dedicated cutting tool. A POF cable segment, length of 50 metres, with fibre diameter (including jacket) included between 1,5 and 2,2 mm. A setup with straight wires without any bends. A POF active equipment with connector less MDI interface.	
Expected behaviour	
Connecting the POF cable to the equipment MDI interfaces. POF cable introduction into the MDI interface should be realized without complete insertion. POF cable manipulation near the connector less MDI interface should impact the light transmission at the other extremity of the cable.	
Final situation	
POF cable should be inappropriately inserted and the incorrect clamping of the MDI interface should impact the signal transmission. Red Light observation on the unconnected extremity of the POD cable may be impacted, interrupted or potentially blocked and provides very low visual lightning conditions or no lightning signal at all.	

=bending=

TP ID	TP/POF/PSPT/MEDIA/BI/02
Test objective	Verifying optical impact of many bends across the POF cable on light transmission through the fibre with a length of 50 metres with 30 bends.
Initial situation	
Cutting the POF cable with a dedicated cutting tool. A POF cable segment of 50 metres with fibre diameter (including jacket) included between 1,5 and 2,2 mm. A setup with straight wires with 30 bends. Bends should be of radius 12 mm. All bends should have the same diameter. A POF active equipment (media converter or Ethernet switch) with connector less MDI interface.	
Expected behaviour	
Connecting the POF cable to the equipment MDI interfaces. Inserting 30 bends across the POF cable path should impact the light transmission at the other extremity of the cable.	
Final situation	
Red Light observation on the unconnected extremity of the POF cable may be impacted, interrupted or potentially blocked and provides very low visual lightning conditions or no lightning signal at all.	

=damage; injury=

TP ID	TP/POF/PSPT/MEDIA/BI/03
Test objective	Verifying optical impact of POF cable MDI physical interface clamping on light transmission through the fibre with a length of 50 metres without any bends when POF cable is damaged (chew, crush or torsion with an injury on the cable jacket).
Initial situation	
Cutting the POF cable with a dedicated cutting tool. A POF cable segment of 50 metres with fibre diameter (including jacket) included between 1,5 and 2,2 mm. A setup with straight wires without any bends. A POF active equipment (media converter or Ethernet switch) with connector less MDI interface.	
Expected behaviour	
Setup the operation with an injury on the POF cable: firmly chew, crush or apply a strong torsion the cable anywhere and scrap the cable jacket (making the fibre core visible). Connecting the POF cable to the equipment MDI interfaces. Damage to the POF cable has an impact light transmission at the other extremity of the cable. Some light exits at the damage location as fibre core is visible.	
Final situation	
Red Light observation on the unconnected extremity of the POF cable may be impacted, interrupted or potentially blocked and provides very low lightning conditions or no lightning signal at all. Red Light is visible at the location of the cable's injury.	

4.5.2 POF Semi-active tests

4.5.2.0 Semi-active category

This category of tests is related to the mechanicals characteristics of the media and the impact of bend losses on the light path. Tests in this category involve:

- the termination of a both side of the POF cable media;
- with active POF equipment;
- without involving any Internet Protocol (IP) over Ethernet network host.

Tests investigations in this category are realized through visual observations of POF active equipment behaviours.

To operate correctly, the POF active equipment should be able to transmit and receive light signals with a sufficient power to enable the Ethernet physical layer (PHY) to sync up at the highest common DATA speed rate, the media access control (MAC) layer to determine if media is connected or not and the CSMA/CD interface protocol to operate.

An active POF equipment is from types: standalone media converter (100 Mbps, 1 Gbps, 100 Mbps/1 Gbps); Ethernet switch (100 Mbps, 1 Gbps or 100 Mbps/1 Gbps interfaces ports).

When a test specifies a media converter interface, the equipment can be either a standalone POF media converter or one port of a POF Ethernet switch.

4.5.2.1 SEMI ACTIVE - TP/POF/SAT/ACOMPONENT/BV

=100 Mbps interfaces; no bending=

TP ID	TP/POF/SAT/ACOMPONENT/BV/01
Test objective	Verify compliancy of the Auto MDI sync status and resulting data rate speed operation through the fibre with a length of 10 metres without any bends for 100 Mbps media converters link.
Initial situation	
POF cable cut with a dedicated cutting tool. Correct coupling of the POF cable with the MDI interface clamping. A POF cable segment, length of 10 metres, with fibre diameter (including jacket) included between 1,5 and 2,2 mm. A setup with straight wires without any bends. Two POF active equipment with connector less MDI interface: two 100 Mbps media converters.	
Expected behaviour	
Connecting the POF cable to the equipment MDI interfaces. When both POF active equipment will have their respective transmit (TX) and receive (RX) interfaces connected to each other, PHY and MAC Ethernet protocol layers should operate normally.	
Final situation	
The link status of the media converters should both indicate correct sync state. The data rate speed operation status should be 100 Mbps on both equipment interfaces.	

TP ID	TP/POF/SAT/ACOMPONENT/BV/02
Test objective	Verify compliancy of the Auto MDI sync status and resulting data rate speed operation through the fibre with a length of 50 metres without any bends for 100 Mbps media converters link.
Initial situation	
POF cable cut with a dedicated cutting tool. Correct coupling of the POF cable with the MDI interface clamping. A POF cable segment, length of 50 metres, with fibre diameter (including jacket) included between 1,5 and 2,2 mm. A setup with straight wires without any bends. Two POF active equipment with connector less MDI interface: two 100 Mbps media converters.	
Expected behaviour	
Connecting the POF cable to the equipment MDI interfaces. When both POF active equipment will have their respective transmit (TX) and receive (RX) interfaces connected to each other, PHY and MAC Ethernet protocol layers should operate normally.	
Final situation	
The link status of the media converters should both indicate correct sync state. The data rate speed operation status should be 100 Mbps on both equipment interfaces.	

TP ID	TP/POF/SAT/ACOMPONENT/BV/03
Test objective	Verify compliancy of the Auto MDI sync status and resulting data rate speed operation through the fibre with a length of 100 metres without any bends for 100 Mbps media converters link.
Initial situation	
POF cable cut with a dedicated cutting tool. Correct coupling of the POF cable with the MDI interface clamping. A POF cable segment, length of 100 metres, with fibre diameter (including jacket) included between 1,5 and 2,2 mm. A setup with straight wires without any bends. Two POF active equipment with connector less MDI interface: two 100 Mbps media converters.	
Expected behaviour	
Connecting the POF cable to the equipment MDI interfaces. When both POF active equipment will have their respective transmit (TX) and receive (RX) interfaces connected to each other, PHY and MAC Ethernet protocol layers should operate normally.	
Final situation	
The link status of the media converters should both indicate correct sync state. The data rate speed operation status should be 100 Mbps on both equipment interfaces.	

=1 Gbps interfaces; no bending=

TP ID	TP/POF/SAT/ACOMPONENT/BV/04
Test objective	Verify compliancy of the Auto MDI sync status and resulting data rate speed operation through the fibre with a length of 10 metres without any bends for 1 Gbps media converters link.
Initial situation	
POF cable cut with a dedicated cutting tool. Correct coupling of the POF cable with the MDI interface clamping. A POF cable segment, length of 10 metres, with fibre diameter (including jacket) included between 1,5 and 2,2 mm. A setup with straight wires without any bends. Two POF active equipment with connector less MDI interface: two 1 Gbps media converters.	
Expected behaviour	
Connecting the POF cable to the equipment MDI interfaces. When both POF active equipment will have their respective transmit (TX) and receive (RX) interfaces connected to each other, PHY and MAC Ethernet protocol layers should operate normally.	
Final situation	
The link status of the media converters should both indicate correct sync state. The data rate speed operation status should be 1 Gbps on both equipment interfaces.	

TP ID	TP/POF/SAT/ACOMPONENT/BV/05
Test objective	Verify compliancy of the Auto MDI sync status and resulting data rate speed operation through the fibre with a length of 50 metres without any bends for 1 Gbps media converters link.
Initial situation	
POF cable cut with a dedicated cutting tool. Correct coupling of the POF cable with the MDI interface clamping. A POF cable segment, length of 50 metres, with fibre diameter (including jacket) included between 1,5 and 2,2 mm. A setup with straight wires without any bends. Two POF active equipment with connector less MDI interface: two 1 Gbps media converters.	
Expected behaviour	
Connecting the POF cable to the equipment MDI interfaces. When both POF active equipment will have their respective transmit (TX) and receive (RX) interfaces connected to each other, PHY and MAC Ethernet protocol layers should operate normally.	
Final situation	
The link status of the media converters should both indicate correct sync state. The data rate speed operation status should be 1 Gbps on both equipment interfaces.	

TP ID	TP/POF/SAT/ACOMPONENT/BV/06
Test objective	Verify compliancy of the Auto MDI sync status and resulting data rate speed operation through the fibre with a length of 100 metres without any bends for 1 Gbps media converters link.
Initial situation	
POF cable cut with a dedicated cutting tool. Correct coupling of the POF cable with the MDI interface clamping. A POF cable segment, length of 100 metres, with fibre diameter (including jacket) included between 1,5 and 2,2 mm. A setup with straight wires without any bends. Two POF active equipment with connector less MDI interface: two 1 Gbps media converters.	
Expected behaviour	
Connecting the POF cable to the equipment MDI interfaces. When both POF active equipment will have their respective transmit (TX) and receive (RX) interfaces connected to each other, PHY and MAC Ethernet protocol layers should operate normally.	
Final situation	
The link status of the media converters should both indicate correct sync state. The data rate speed operation status should be 1 Gbps on both equipment interfaces.	

=100 Mbps/1 Gbps interfaces; no bending=

TP ID	TP/POF/SAT/ACOMPONENT/BV/07
Test objective	Verify compliancy of the Auto MDI sync status and resulting data rate speed operation through the fibre with a length of 10 metres without any bends for two 100 Mbps/1 Gbps media converter link.
Initial situation	
POF cable cut with a dedicated cutting tool. Correct coupling of the POF cable with the MDI interface clamping. A POF cable segment, length of 10 metres, with fibre diameter (including jacket) included between 1,5 and 2,2 mm. A setup with straight wires without any bends. Two POF active equipment with connector less MDI interface: two 100 Mbps/1 Gbps media converter.	
Expected behaviour	
Connecting the POF cable to the equipment MDI interfaces. When both POF active equipment will have their respective transmit (TX) and receive (RX) interfaces connected to each other, PHY and MAC Ethernet protocol layers should operate normally. Data rate speed operation should result at 1 Gbps link.	
Final situation	
The link status of the media converters should both indicate correct sync state. The data rate speed operation status should be 1 Gbps on both equipment interfaces.	

TP ID	TP/POF/SAT/ACOMPONENT/BV/08
Test objective	Verify compliancy of the Auto MDI sync status and resulting data rate speed operation through the fibre with a length of 50 metres without any bends for two 100 Mbps/1 Gbps media converter link.
Initial situation	
POF cable cut with a dedicated cutting tool. Correct coupling of the POF cable with the MDI interface clamping. A POF cable segment, length of 50 metres, with fibre diameter (including jacket) included between 1,5 and 2,2 mm. A setup with straight wires without any bends. Two POF active equipment with connector less MDI interface: two 100 Mbps/1 Gbps media converter	
Expected behaviour	
Connecting the POF cable to the equipment MDI interfaces. When both POF active equipment will have their respective transmit (TX) and receive (RX) interfaces connected to each other, PHY and MAC Ethernet protocol layers should operate normally. Data rate speed operation should result at 1 Gbps link.	
Final situation	
The link status of the media converters should both indicate correct sync state. The data rate speed operation status should be 1 Gbps on both equipment interfaces.	

TP ID	TP/POF/SAT/ACOMPONENT/BV/09
Test objective	Verify compliancy of the Auto MDI sync status and resulting data rate speed operation through the fibre with a length of 100 metres without any bends for two 100 Mbps/1 Gbps media converters link.
Initial situation	
POF cable cut with a dedicated cutting tool. Correct coupling of the POF cable with the MDI interface clamping. A POF cable segment, length of 100 metres, with fibre diameter (including jacket) included between 1,5 and 2,2 mm. A setup with straight wires without any bends. Two POF active equipment with connector less MDI interface: two 100 Mbps/1 Gbps media converter.	
Expected behaviour	
Connecting the POF cable to the equipment MDI interfaces. When both POF active equipment will have their respective transmit (TX) and receive (RX) interfaces connected to each other, PHY and MAC Ethernet protocol layers should operate normally. Data rate speed operation should result at 1 Gbps link.	
Final situation	
The link status of the media converters should both indicate correct sync state. The data rate speed operation status should be 1 Gbps on both equipment interfaces.	

=100 Mbps & 100 Mbps/1 Gbps interfaces; no bending=

TP ID	TP/POF/SAT/ACOMPONENT/BV/10
Test objective	Verify compliancy of the Auto MDI sync status and resulting data rate speed operation through the fibre with a length of 10 metres without any bends for 100 Mbps media converter & 100 Mbps/1 Gbps media converter link.
Initial situation	
POF cable cut with a dedicated cutting tool. Correct coupling of the POF cable with the MDI interface clamping. A POF cable segment, length of 10 metres, with fibre diameter (including jacket) included between 1,5 and 2,2 mm. A setup with straight wires without any bends. Two POF active equipment with connector less MDI interface: one 100 Mbps media converter and one 100 Mbps/1 Gbps media converter.	
Expected behaviour	
Connecting the POF cable to the equipment MDI interfaces. When both POF active equipment will have their respective transmit (TX) and receive (RX) interfaces connected to each other, PHY and MAC Ethernet protocol layers should operate normally. Data rate speed operation should result at 100 Mbps link.	
Final situation	
The link status of the media converters should both indicate correct sync state. The data rate speed operation status should be 100 Mbps on both equipment interfaces.	

TP ID	TP/POF/SAT/ACOMPONENT/BV/11
Test objective	Verify compliancy of the Auto MDI sync status and resulting data rate speed operation through the fibre with a length of 50 metres without any bends for 100 Mbps media converter & 100 Mbps/1 Gbps media converter link.
Initial situation	
POF cable cut with a dedicated cutting tool. Correct coupling of the POF cable with the MDI interface clamping. A POF cable segment, length of 50 metres, with fibre diameter (including jacket) included between 1,5 and 2,2 mm. A setup with straight wires without any bends. Two POF active equipment with connector less MDI interface: one 100 Mbps media converter and one 100 Mbps/1 Gbps media converter.	
Expected behaviour	
Connecting the POF cable to the equipment MDI interfaces. When both POF active equipment will have their respective transmit (TX) and receive (RX) interfaces connected to each other, PHY and MAC Ethernet protocol layers should operate normally. Data rate speed operation should result at 100 Mbps link.	
Final situation	
The link status of the media converters should both indicate correct sync state. The data rate speed operation status should be 100 Mbps on both equipment interfaces.	

TP ID	TP/POF/SAT/ACOMPONENT/BV/12
Test objective	Verify compliancy of the Auto MDI sync status and resulting data rate speed operation through the fibre with a length of 100 metres without any bends for 100 Mbps media converter & 100 Mbps/1 Gbps media converter link.
Initial situation	
POF cable cut with a dedicated cutting tool. Correct coupling of the POF cable with the MDI interface clamping. A POF cable segment, length of 100 metres, with fibre diameter (including jacket) included between 1,5 and 2,2 mm. A setup with straight wires without any bends. Two POF active equipment with connector less MDI interface: one 100 Mbps media converter and one 100 Mbps/1 Gbps media converter.	
Expected behaviour	
Connecting the POF cable to the equipment MDI interfaces. When both POF active equipment will have their respective transmit (TX) and receive (RX) interfaces connected to each other, PHY and MAC Ethernet protocol layers should operate normally. Data rate speed operation should result at 100 Mbps link.	
Final situation	
The link status of the media converters should both indicate correct sync state. The data rate speed operation status should be 100 Mbps on both equipment interfaces.	

=1 Gbps & 100 Mbps/1 Gbps interfaces; no bending=

TP ID	TP/POF/SAT/ACOMPONENT/BV/13
Test objective	Verify compliancy of the Auto MDI sync status and resulting data rate speed operation through the fibre with a length of 10 metres without any bends for 1 Gbps media converter & 100 Mbps/1 Gbps media converter link.
Initial situation	
POF cable cut with a dedicated cutting tool. Correct coupling of the POF cable with the MDI interface clamping. A POF cable segment, length of 10 metres, with fibre diameter (including jacket) included between 1,5 and 2,2 mm. A setup with straight wires without any bends. Two POF active equipment with connector less MDI interface: one 1 Gbps media converter and one 100 Mbps/1 Gbps media converter.	
Expected behaviour	
Connecting the POF cable to the equipment MDI interfaces. When both POF active equipment will have their respective transmit (TX) and receive (RX) interfaces connected to each other, PHY and MAC Ethernet protocol layers should operate normally. Data rate speed operation should result at 1 Gbps link.	
Final situation	
The link status of the media converters should both indicate correct sync state. The data rate speed operation status should be 1 Gbps on both equipment interfaces.	

TP ID	TP/POF/SAT/ACOMPONENT/BV/14
Test objective	Verify compliancy of the Auto MDI sync status and resulting data rate speed operation through the fibre with a length of 50 metres without any bends for 1 Gbps media converter & 100 Mbps/1 Gbps media converter link.
Initial situation	
POF cable cut with a dedicated cutting tool. Correct coupling of the POF cable with the MDI interface clamping. A POF cable segment, length of 50 metres, with fibre diameter (including jacket) included between 1,5 and 2,2 mm. A setup with straight wires without any bends. Two POF active equipment with connector less MDI interface: one 1 Gbps media converter and one 100 Mbps/1 Gbps media converter.	
Expected behaviour	
Connecting the POF cable to the equipment MDI interfaces. When both POF active equipment will have their respective transmit (TX) and receive (RX) interfaces connected to each other, PHY and MAC Ethernet protocol layers should operate normally. Data rate speed operation should result at 1 Gbps link.	
Final situation	
The link status of the media converters should both indicate correct sync state. The data rate speed operation status should be 1 Gbps on both equipment.	

TP ID	TP/POF/SAT/ACOMPONENT/BV/15
Test objective	Verify compliancy of the Auto MDI sync status and resulting data rate speed operation through the fibre with a length of 100 metres without any bends for 1 Gbps media converter & 100 Mbps/1 Gbps media converter link.
Initial situation	
POF cable cut with a dedicated cutting tool. Correct coupling of the POF cable with the MDI interface clamping. A POF cable segment, length of 100 metres, with fibre diameter (including jacket) included between 1,5 and 2,2 mm. A setup with straight wires without any bends. Two POF active equipment with connector less MDI interface: one 1 Gbps media converter and one 100 Mbps/1 Gbps media converter.	
Expected behaviour	
Connecting the POF cable to the equipment MDI interfaces. When both POF active equipment will have their respective transmit (TX) and receive (RX) interfaces connected to each other, PHY and MAC Ethernet protocol layers should operate normally. Data rate speed operation should result at 1 Gbps link.	
Final situation	
The link status of the media converters should both indicate correct sync state. The data rate speed operation status should be 1 Gbps on both equipment interfaces.	

4.5.2.2 SEMI ACTIVE - TP/POF/SAT/ACOMPONENT/BI

=100 Mbps & 1 Gbps interfaces =

TP ID	TP/POF/SAT/ACOMPONENT/BI/01
Test objective	Verify non-compliancy of the Auto MDI sync status and resulting data rate speed operation through the fibre with a length of 10 metres without any bends for 100 Mbps media converters & 1 Gbps media converters link.
Initial situation	
POF cable cut with a dedicated cutting tool. Correct coupling of the POF cable with the MDI interface clamping. A POF cable segment, length of 10 metres, with fibre diameter (including jacket) included between 1,5 and 2,2 mm. A setup with straight wires without any bends. Two POF active equipment with connector less MDI interface: one 100 Mbps media converter and one 1 Gbps media converter.	
Expected behaviour	
Connecting the POF cable to the equipment MDI interfaces. When both POF active equipment will have their respective transmit (TX) and receive (RX) interfaces connected to each other, PHY and MAC Ethernet protocol layers should not operate normally. Data rate speed operation should result at no link.	
Final situation	
The link status of the media converters should both indicate incorrect sync state. The data rate speed operation status should be undefined on both equipment interfaces.	

4.5.2.3 SEMI ACTIVE - TP/POF/SAT/MEDIA/BV

=100 Mbps interfaces; bending=

TP ID	TP/POF/SAT/MEDIA/BV/01
Test objective	Verify compliancy of the Auto MDI sync status and resulting data rate speed operation through the fibre with a length of 10 metres with 5 bends for 100 Mbps media converters link.
Initial situation	
POF cable cut with a dedicated cutting tool. Correct coupling of the POF cable with the MDI interface clamping. A POF cable segment, length of 10 metres, with fibre diameter (including jacket) included between 1,5 and 2,2 mm. A setup with straight wires with 5 bends (2,5 loops). Bends should be of radius 12 mm. All bends should have the same diameter. Two POF active equipment with connector less MDI interface: two 100 Mbps media converters.	
Expected behaviour	
Connecting the POF cable to the equipment MDI interfaces. When both POF active equipment will have their respective transmit (TX) and receive (RX) interfaces connected to each other, PHY and MAC Ethernet protocol layers should operate normally even in the presence of cable bends across the POF cable path.	
Final situation	
The link status of the media converters should both indicate correct sync state. The data rate speed operation status should be at 100 Mbps on both equipment interfaces.	

TP ID	TP/POF/SAT/MEDIA/BV/02
Test objective	Verify compliancy of the Auto MDI sync status and resulting data rate speed operation through the fibre with a length of 50 metres with 5 bends for 100 Mbps media converters link.
Initial situation	
POF cable cut with a dedicated cutting tool. Correct coupling of the POF cable with the MDI interface clamping. A POF cable segment, length of 50 metres, with fibre diameter (including jacket) included between 1,5 and 2,2 mm. A setup with straight wires with 5 bends (2,5 loops). Bends should be of radius 12 mm. All bends should have the same diameter. Two POF active equipment with connector less MDI interface: two 100 Mbps media converters.	
Expected behaviour	
Connecting the POF cable to the equipment MDI interfaces. When both POF active equipment will have their respective transmit (TX) and receive (RX) interfaces connected to each other, PHY and MAC Ethernet protocol layers should operate normally even in the presence of cable bends across the POF cable path.	
Final situation	
The link status of the media converters should both indicate correct sync state. The data rate speed operation status should be at 100 Mbps on both equipment interfaces.	

TP ID	TP/POF/SAT/MEDIA/BV/03
Test objective	Verify compliancy of the Auto MDI sync status and resulting data rate speed operation through the fibre with a length of 100 metres with 5 bends for 100 Mbps media converters link.
Initial situation	
POF cable cut with a dedicated cutting tool. Correct coupling of the POF cable with the MDI interface clamping. A POF cable segment, length of 100 metres, with fibre diameter (including jacket) included between 1,5 and 2,2 mm. A setup with straight wires with 5 bends (2,5 loops). Bends should be of radius 12 mm. All bends should have the same diameter. Two POF active equipment with connector less MDI interface: two 100 Mbps media converters.	
Expected behaviour	
Connecting the POF cable to the equipment MDI interfaces. When both POF active equipment will have their respective transmit (TX) and receive (RX) interfaces connected to each other, PHY and MAC Ethernet protocol layers should operate normally even in the presence of cable bends across the POF cable path.	
Final situation	
The link status of the media converters should both indicate correct sync state. The data rate speed operation status should be at 100 Mbps on both equipment interfaces.	

TP ID	TP/POF/SAT/MEDIA/BV/04
Test objective	Verify compliancy of the Auto MDI sync status and resulting data rate speed operation through the fibre with a length of 10 metres with 10 bends for 100 Mbps media converters link.
Initial situation	
POF cable cut with a dedicated cutting tool. Correct coupling of the POF cable with the MDI interface clamping. A POF cable segment, length of 10 metres, with fibre diameter (including jacket) included between 1,5 and 2,2 mm. A setup with straight wires with 10 bends (5 loops). Bends should be of radius 12 mm. All bends should have the same diameter. Two POF active equipment with connector less MDI interface: two 100 Mbps media converters.	
Expected behaviour	
Connecting the POF cable to the equipment MDI interfaces. When both POF active equipment will have their respective transmit (TX) and receive (RX) interfaces connected to each other, PHY and MAC Ethernet protocol layers should operate normally even in the presence of cable bends across the POF cable path.	
Final situation	
The link status of the media converters should both indicate correct sync state. The data rate speed operation status should be at 100 Mbps on both equipment interfaces.	

TP ID	TP/POF/SAT/MEDIA/BV/05
Test objective	Verify compliancy of the Auto MDI sync status and resulting data rate speed operation through the fibre with a length of 50 metres with 10 bends for 100 Mbps media converters link.
Initial situation	
POF cable cut with a dedicated cutting tool. Correct coupling of the POF cable with the MDI interface clamping. A POF cable segment, length of 50 metres, with fibre diameter (including jacket) included between 1,5 and 2,2 mm. A setup with straight wires with 10 bends (5 loops). Bends should be of radius 12 mm. All bends should have the same diameter. Two POF active equipment with connector less MDI interface: two 100 Mbps media converters.	
Expected behaviour	
Connecting the POF cable to the equipment MDI interfaces. When both POF active equipment will have their respective transmit (TX) and receive (RX) interfaces connected to each other, PHY and MAC Ethernet protocol layers should operate normally even in the presence of cable bends across the POF cable path.	
Final situation	
The link status of the media converters should both indicate correct sync state. The data rate speed operation status should be at 100 Mbps on both equipment interfaces.	

TP ID	TP/POF/SAT/MEDIA/BV/06
Test objective	Verify compliancy of the Auto MDI sync status and resulting data rate speed operation through the fibre with a length of 100 metres with 10 bends for 100 Mbps media converters link.
Initial situation	
POF cable cut with a dedicated cutting tool. Correct coupling of the POF cable with the MDI interface clamping. A POF cable segment, length of 100 metres, with fibre diameter (including jacket) included between 1,5 and 2,2 mm. A setup with straight wires with 10 bends (5 loops). Bends should be of radius 12 mm. All bends should have the same diameter. Two POF active equipment with connector less MDI interface: two 100 Mbps media converters.	
Expected behaviour	
Connecting the POF cable to the equipment MDI interfaces. When both POF active equipment will have their respective transmit (TX) and receive (RX) interfaces connected to each other, PHY and MAC Ethernet protocol layers should operate normally even in the presence of cable bends across the POF cable path.	
Final situation	
The link status of the media converters should both indicate correct sync state. The data rate speed operation status should be at 100 Mbps on both equipment interfaces.	

=1 Gbps interfaces; bending=

TP ID	TP/POF/SAT/MEDIA/BV/07
Test objective	Verify compliancy of the Auto MDI sync status and resulting data rate speed operation through the fibre with a length of 10 metres with 5 bends for 1 Gbps media converters link.
Initial situation	
POF cable cut with a dedicated cutting tool. Correct coupling of the POF cable with the MDI interface clamping. A POF cable segment, length of 10 metres, with fibre diameter (including jacket) included between 1,5 and 2,2 mm. A setup with straight wires with 5 bends (2,5 loops). Bends should be of radius 12 mm. All bends should have the same diameter. Two POF active equipment with connector less MDI interface: two 1 Gbps media converters.	
Expected behaviour	
Connecting the POF cable to the equipment MDI interfaces. When both POF active equipment will have their respective transmit (TX) and receive (RX) interfaces connected to each other, PHY and MAC Ethernet protocol layers should operate normally even in the presence of cable bends across the POF cable path.	
Final situation	
The link status of the media converters should both indicate correct sync state. The data rate speed operation status should be 1 Gbps on both equipment interfaces.	

TP ID	TP/POF/SAT/MEDIA/BV/08
Test objective	Verify compliancy of the Auto MDI sync status and resulting data rate speed operation through the fibre with a length of 50 metres with 5 bends for 1 Gbps media converters link.
Initial situation	
POF cable cut with a dedicated cutting tool. Correct coupling of the POF cable with the MDI interface clamping. A POF cable segment, length of 50 metres, with fibre diameter (including jacket) included between 1,5 and 2,2 mm. A setup with straight wires with 5 bends (2,5 loops). Bends should be of radius 12 mm. All bends should have the same diameter. Two POF active equipment with connector less MDI interface: two 1 Gbps media converters.	
Expected behaviour	
Connecting the POF cable to the equipment MDI interfaces. When both POF active equipment will have their respective transmit (TX) and receive (RX) interfaces connected to each other, PHY and MAC Ethernet protocol layers should operate normally even in the presence of cable bends across the POF cable path.	
Final situation	
The link status of the media converters should both indicate correct sync state. The data rate speed operation status should be 1 Gbps on both equipment interfaces.	

TP ID	TP/POF/SAT/MEDIA/BV/09
Test objective	Verify compliancy of the Auto MDI sync status and resulting data rate speed operation through the fibre with a length of 100 metres with 5 bends for 1 Gbps media converters link.
Initial situation	
POF cable cut with a dedicated cutting tool. Correct coupling of the POF cable with the MDI interface clamping. A POF cable segment, length of 100 metres, with fibre diameter (including jacket) included between 1,5 and 2,2 mm. A setup with straight wires with 5 bends (2,5 loops). Bends should be of radius 12 mm. All bends should have the same diameter. Two POF active equipment with connector less MDI interface: two 1 Gbps media converters.	
Expected behaviour	
Connecting the POF cable to the equipment MDI interfaces. When both POF active equipment will have their respective transmit (TX) and receive (RX) interfaces connected to each other, PHY and MAC Ethernet protocol layers should operate normally even in the presence of cable bends across the POF cable path.	
Final situation	
The link status of the media converters should both indicate correct sync state. The data rate speed operation status should be 1 Gbps on both equipment interfaces.	

TP ID	TP/POF/SAT/MEDIA/BV/10
Test objective	Verify compliancy of the Auto MDI sync status and resulting data rate speed operation through the fibre with a length of 10 metres with 10 bends for 1 Gbps media converters link.
Initial situation	
POF cable cut with a dedicated cutting tool. Correct coupling of the POF cable with the MDI interface clamping. A POF cable segment, length of 10 metres, with fibre diameter (including jacket) included between 1,5 and 2,2 mm. A setup with straight wires with 10 bends (5 loops). Bends should be of radius 12 mm. All bends should have the same diameter. Two POF active equipment with connector less MDI interface: two 1 Gbps media converters.	
Expected behaviour	
Connecting the POF cable to the equipment MDI interfaces. When both POF active equipment will have their respective transmit (TX) and receive (RX) interfaces connected to each other, PHY and MAC Ethernet protocol layers should operate normally even in the presence of cable bends across the POF cable path.	
Final situation	
The link status of the media converters should both indicate correct sync state. The data rate speed operation status should be 1 Gbps on both equipment interfaces.	

TP ID	TP/POF/SAT/MEDIA/BV/11
Test objective	Verify compliancy of the Auto MDI sync status and resulting data rate speed operation through the fibre with a length of 50 metres with 10 bends for 1 Gbps media converters link.
Initial situation	
POF cable cut with a dedicated cutting tool. Correct coupling of the POF cable with the MDI interface clamping. A POF cable segment, length of 50 metres, with fibre diameter (including jacket) included between 1,5 and 2,2 mm. A setup with straight wires with 10 bends (5 loops). Bends should be of radius 12 mm. All bends should have the same diameter. Two POF active equipment with connector less MDI interface: two 1 Gbps media converters.	
Expected behaviour	
Connecting the POF cable to the equipment MDI interfaces. When both POF active equipment will have their respective transmit (TX) and receive (RX) interfaces connected to each other, PHY and MAC Ethernet protocol layers should operate normally even in the presence of cable bends across the POF cable path.	
Final situation	
The link status of the media converters should both indicate correct sync state. The data rate speed operation status should be 1 Gbps on both equipment interfaces.	

TP ID	TP/POF/SAT/MEDIA/BV/12
Test objective	Verify compliancy of the Auto MDI sync status and resulting data rate speed operation through the fibre with a length of 100 metres with 10 bends for 1 Gbps media converters link.
Initial situation	
POF cable cut with a dedicated cutting tool. Correct coupling of the POF cable with the MDI interface clamping. A POF cable segment, length of 100 metres, with fibre diameter (including jacket) included between 1,5 and 2,2 mm. A setup with straight wires with 10 bends (5 loops). Bends should be of radius 12 mm. All bends should have the same diameter. Two POF active equipment with connector less MDI interface: two 1 Gbps media converters.	
Expected behaviour	
Connecting the POF cable to the equipment MDI interfaces. When both POF active equipment will have their respective transmit (TX) and receive (RX) interfaces connected to each other, PHY and MAC Ethernet protocol layers should operate normally even in the presence of cable bends across the POF cable path.	
Final situation	
The link status of the media converters should both indicate correct sync state. The data rate speed operation status should be 1 Gbps on both equipment interfaces.	

=100 Mbps/1 Gbps interfaces; bending=

TP ID	TP/POF/SAT/MEDIA/BV/13
Test objective	Verify compliancy of the Auto MDI sync status and resulting data rate speed operation through the fibre with a length of 10 metres with 5 bends for two 100 Mbps/1 Gbps media converter link.
Initial situation	
POF cable cut with a dedicated cutting tool. Correct coupling of the POF cable with the MDI interface clamping. A POF cable segment, length of 10 metres, with fibre diameter (including jacket) included between 1,5 and 2,2 mm. A setup with straight wires with 5 bends (2,5 loops). Bends should be of radius 12 mm. All bends should have the same diameter. Two POF active equipment with connector less MDI interface: two 100 Mbps/1 Gbps media converter.	
Expected behaviour	
Connecting the POF cable to the equipment MDI interfaces. When both POF active equipment will have their respective transmit (TX) and receive (RX) interfaces connected to each other, PHY and MAC Ethernet protocol layers should operate normally even in the presence of cable bends across the POF cable path.	
Final situation	
The link status of the media converters should both indicate correct sync state. The data rate speed operation status should be 1 Gbps on both equipment interfaces.	

TP ID	TP/POF/SAT/MEDIA/BV/14
Test objective	Verify compliancy of the Auto MDI sync status and resulting data rate speed operation through the fibre with a length of 50 metres with 5 bends for two 100 Mbps/1 Gbps media converter link.
Initial situation	
POF cable cut with a dedicated cutting tool. Correct coupling of the POF cable with the MDI interface clamping. A POF cable segment, length of 50 metres, with fibre diameter (including jacket) included between 1,5 and 2,2 mm. A setup with straight wires with 5 bends (2,5 loops). Bends should be of radius 12 mm. All bends should have the same diameter. Two POF active equipment with connector less MDI interface: two 100 Mbps/1 Gbps media converter.	
Expected behaviour	
Connecting the POF cable to the equipment MDI interfaces. When both POF active equipment will have their respective transmit (TX) and receive (RX) interfaces connected to each other, PHY and MAC Ethernet protocol layers should operate normally even in the presence of cable bends across the POF cable path.	
Final situation	
The link status of the media converters should both indicate correct sync state. The data rate speed operation status should be 1 Gbps on both equipment interfaces.	

TP ID	TP/POF/SAT/MEDIA/BV/15
Test objective	Verify compliancy of the Auto MDI sync status and resulting data rate speed operation through the fibre with a length of 100 metres with 5 bends for two 100 Mbps/1 Gbps media converter link.
Initial situation	
POF cable cut with a dedicated cutting tool. Correct coupling of the POF cable with the MDI interface clamping. A POF cable segment, length of 100 metres, with fibre diameter (including jacket) included between 1,5 and 2,2 mm. A setup with straight wires with 5 bends (2,5 loops). Bends should be of radius 12 mm. All bends should have the same diameter. Two POF active equipment with connector less MDI interface: two 100 Mbps/1 Gbps media converter.	
Expected behaviour	
Connecting the POF cable to the equipment MDI interfaces. When both POF active equipment will have their respective transmit (TX) and receive (RX) interfaces connected to each other, PHY and MAC Ethernet protocol layers should operate normally even in the presence of cable bends across the POF cable path.	
Final situation	
The link status of the media converters should both indicate correct sync state. The data rate speed operation status should be 1 Gbps on both equipment interfaces.	

TP ID	TP/POF/SAT/MEDIA/BV/16
Test objective	Verify compliancy of the Auto MDI sync status and resulting data rate speed operation through the fibre with a length of 10 metres with 10 bends for two 100 Mbps/1 Gbps media converter link.
Initial situation	
POF cable cut with a dedicated cutting tool. Correct coupling of the POF cable with the MDI interface clamping. A POF cable segment, length of 10 metres, with fibre diameter (including jacket) included between 1,5 and 2,2 mm. A setup with straight wires with 10 bends (5 loops). Bends should be of radius 12 mm. All bends should have the same diameter. Two POF active equipment with connector less MDI interface: two 100 Mbps/1 Gbps media converter.	
Expected behaviour	
Connecting the POF cable to the equipment MDI interfaces. When both POF active equipment will have their respective transmit (TX) and receive (RX) interfaces connected to each other, PHY and MAC Ethernet protocol layers should operate normally even in the presence of cable bends across the POF cable path.	
Final situation	
The link status of the media converters should both indicate correct sync state. The data rate speed operation status should be 1 Gbps on both equipment interfaces.	

TP ID	TP/POF/SAT/MEDIA/BV/17
Test objective	Verify compliancy of the Auto MDI sync status and resulting data rate speed operation through the fibre with a length of 50 metres with 10 bends for two 100 Mbps/1 Gbps media converter link.
Initial situation	
POF cable cut with a dedicated cutting tool. Correct coupling of the POF cable with the MDI interface clamping. A POF cable segment, length of 50 metres, with fibre diameter (including jacket) included between 1,5 and 2,2 mm. A setup with straight wires with 10 bends (5 loops). Bends should be of radius 12 mm. All bends should have the same diameter. Two POF active equipment with connector less MDI interface: two 100 Mbps/1 Gbps media converter.	
Expected behaviour	
Connecting the POF cable to the equipment MDI interfaces. When both POF active equipment will have their respective transmit (TX) and receive (RX) interfaces connected to each other, PHY and MAC Ethernet protocol layers should operate normally even in the presence of cable bends across the POF cable path.	
Final situation	
The link status of the media converters should both indicate correct sync state. The data rate speed operation status should be 1 Gbps on both equipment interfaces.	

TP ID	TP/POF/SAT/MEDIA/BV/18
Test objective	Verify compliancy of the Auto MDI sync status and resulting data rate speed operation through the fibre with a length of 100 metres with 10 bends for two 100 Mbps/1 Gbps media converter link.
Initial situation	
POF cable cut with a dedicated cutting tool. Correct coupling of the POF cable with the MDI interface clamping. A POF cable segment, length of 100 metres, with fibre diameter (including jacket) included between 1,5 and 2,2 mm. A setup with straight wires with 10 bends (5 loops). Bends should be of radius 12 mm. All bends should have the same diameter. Two POF active equipment with connector less MDI interface: two 100 Mbps/1 Gbps media converter.	
Expected behaviour	
Connecting the POF cable to the equipment MDI interfaces. When both POF active equipment will have their respective transmit (TX) and receive (RX) interfaces connected to each other, PHY and MAC Ethernet protocol layers should operate normally even in the presence of cable bends across the POF cable path.	
Final situation	
The link status of the media converters should both indicate correct sync state. The data rate speed operation status should be 1 Gbps on both equipment interfaces.	

=100 Mbps & 100 Mbps/1 Gbps interfaces; bending=

TP ID	TP/POF/SAT/MEDIA/BV/19
Test objective	Verify compliancy of the Auto MDI sync status and resulting data rate speed operation through the fibre with a length of 10 metres with 5 bends for 100 Mbps media converter & 100 Mbps/1 Gbps media converter link.
Initial situation	
POF cable cut with a dedicated cutting tool. Correct coupling of the POF cable with the MDI interface clamping. A POF cable segment, length of 10 metres, with fibre diameter (including jacket) included between 1,5 and 2,2 mm. A setup with straight wires with 5 bends (2,5 loops). Bends should be of radius 12 mm. All bends should have the same diameter. Two POF active equipment with connector less MDI interface: one 100 Mbps media converter and one 100 Mbps/1 Gbps media converter.	
Expected behaviour	
Connecting the POF cable to the equipment MDI interfaces. When both POF active equipment will have their respective transmit (TX) and receive (RX) interfaces connected to each other, PHY and MAC Ethernet protocol layers should operate normally even in the presence of cable bends across the POF cable path.	
Final situation	
The link status of the media converters should both indicate correct sync state. The data rate speed operation status should be 100 Mbps on both equipment interfaces.	

TP ID	TP/POF/SAT/MEDIA/BV/20
Test objective	Verify compliancy of the Auto MDI sync status and resulting data rate speed operation through the fibre with a length of 50 metres with 5 bends for 100 Mbps media converter & 100 Mbps/1 Gbps media converter link.
Initial situation	
POF cable cut with a dedicated cutting tool. Correct coupling of the POF cable with the MDI interface clamping. A POF cable segment, length of 50 metres, with fibre diameter (including jacket) included between 1,5 and 2,2 mm. A setup with straight wires with 5 bends (2,5 loops). Bends should be of radius 12 mm. All bends should have the same diameter. Two POF active equipment with connector less MDI interface: one 100 Mbps media converter and one 100 Mbps/1 Gbps media converter.	
Expected behaviour	
Connecting the POF cable to the equipment MDI interfaces. When both POF active equipment will have their respective transmit (TX) and receive (RX) interfaces connected to each other, PHY and MAC Ethernet protocol layers should operate normally even in the presence of cable bends across the POF cable path.	
Final situation	
The link status of the media converters should both indicate correct sync state. The data rate speed operation status should be 100 Mbps on both equipment interfaces.	

TP ID	TP/POF/SAT/MEDIA/BV/21
Test objective	Verify compliancy of the Auto MDI sync status and resulting data rate speed operation through the fibre with a length of 100 metres with 5 bends for 100 Mbps media converter & 100 Mbps/1 Gbps media converter link.
Initial situation	
POF cable cut with a dedicated cutting tool. Correct coupling of the POF cable with the MDI interface clamping. A POF cable segment, length of 100 metres, with fibre diameter (including jacket) included between 1,5 and 2,2 mm. A setup with straight wires with 5 bends (2,5 loops). Bends should be of radius 12 mm. All bends should have the same diameter. Two POF active equipment with connector less MDI interface: one 100 Mbps media converter and one 100 Mbps/1 Gbps media converter.	
Expected behaviour	
Connecting the POF cable to the equipment MDI interfaces. When both POF active equipment will have their respective transmit (TX) and receive (RX) interfaces connected to each other, PHY and MAC Ethernet protocol layers should operate normally even in the presence of cable bends across the POF cable path.	
Final situation	
The link status of the media converters should both indicate correct sync state. The data rate speed operation status should be 100 Mbps on both equipment interfaces.	

TP ID	TP/POF/SAT/MEDIA/BV/22
Test objective	Verify compliancy of the Auto MDI sync status and resulting data rate speed operation through the fibre with a length of 10 metres with 10 bends for 100 Mbps media converter & 100 Mbps/1 Gbps media converter link.
Initial situation	
POF cable cut with a dedicated cutting tool. Correct coupling of the POF cable with the MDI interface clamping. A POF cable segment, length of 10 metres, with fibre diameter (including jacket) included between 1,5 and 2,2 mm. A setup with straight wires with 10 bends (5 loops). Bends should be of radius 12 mm. All bends should have the same diameter. Two POF active equipment with connector less MDI interface: one 100 Mbps media converter and one 100 Mbps/1 Gbps media converter.	
Expected behaviour	
Connecting the POF cable to the equipment MDI interfaces. When both POF active equipment will have their respective transmit (TX) and receive (RX) interfaces connected to each other, PHY and MAC Ethernet protocol layers should operate normally even in the presence of cable bends across the POF cable path.	
Final situation	
The link status of the media converters should both indicate correct sync state. The data rate speed operation status should be 100 Mbps on both equipment interfaces.	

TP ID	TP/POF/SAT/MEDIA/BV/23
Test objective	Verify compliancy of the Auto MDI sync status and resulting data rate speed operation through the fibre with a length of 50 metres with 10 bends for 100 Mbps media converter & 100 Mbps/1 Gbps media converter link.
Initial situation	
POF cable cut with a dedicated cutting tool. Correct coupling of the POF cable with the MDI interface clamping. A POF cable segment, length of 50 metres, with fibre diameter (including jacket) included between 1,5 and 2,2 mm. A setup with straight wires with 10 bends (5 loops). Bends should be of radius 12 mm. All bends should have the same diameter. Two POF active equipment with connector less MDI interface: one 100 Mbps media converter and one 100 Mbps/1 Gbps media converter.	
Expected behaviour	
Connecting the POF cable to the equipment MDI interfaces. When both POF active equipment will have their respective transmit (TX) and receive (RX) interfaces connected to each other, PHY and MAC Ethernet protocol layers should operate normally even in the presence of cable bends across the POF cable path.	
Final situation	
The link status of the media converters should both indicate correct sync state. The data rate speed operation status should be 100 Mbps on both equipment interfaces.	

TP ID	TP/POF/SAT/MEDIA/BV/24
Test objective	Verify compliancy of the Auto MDI sync status and resulting data rate speed operation through the fibre with a length of 100 metres with 10 bends for 100 Mbps media converter & 100 Mbps/1 Gbps media converter link.
Initial situation	
POF cable cut with a dedicated cutting tool. Correct coupling of the POF cable with the MDI interface clamping. A POF cable segment, length of 100 metres, with fibre diameter (including jacket) included between 1,5 and 2,2 mm. A setup with straight wires with 10 bends (5 loops). Bends should be of radius 12 mm. All bends should have the same diameter. Two POF active equipment with connector less MDI interface: one 100 Mbps media converter and one 100 Mbps/1 Gbps media converter.	
Expected behaviour	
Connecting the POF cable to the equipment MDI interfaces. When both POF active equipment will have their respective transmit (TX) and receive (RX) interfaces connected to each other, PHY and MAC Ethernet protocol layers should operate normally even in the presence of cable bends across the POF cable path.	
Final situation	
The link status of the media converters should both indicate correct sync state. The data rate speed operation status should be 100 Mbps on both equipment interfaces.	

=1 Gbps & 100 Mbps/1 Gbps interfaces; bending=

TP ID	TP/POF/SAT/MEDIA/BV/25
Test objective	Verify compliancy of the Auto MDI sync status and resulting data rate speed operation through the fibre with a length of 10 metres with 5 bends for 1 Gbps media converter & 100 Mbps/1 Gbps media converter link.
Initial situation	
POF cable cut with a dedicated cutting tool. Correct coupling of the POF cable with the MDI interface clamping. A POF cable segment, length of 10 metres, with fibre diameter (including jacket) included between 1,5 and 2,2 mm. A setup with straight wires with 5 bends (2,5 loops). Bends should be of radius 12 mm. All bends should have the same diameter. Two POF active equipment with connector less MDI interface: one 1 Gbps media converter and one 100 Mbps/1 Gbps media converter.	
Expected behaviour	
Connecting the POF cable to the equipment MDI interfaces. When both POF active equipment will have their respective transmit (TX) and receive (RX) interfaces connected to each other, PHY and MAC Ethernet protocol layers should operate normally even in the presence of cable bends across the POF cable path.	
Final situation	
The link status of the media converters should both indicate correct sync state. The data rate speed operation status should be 1 Gbps on both equipment interfaces.	

TP ID	TP/POF/SAT/MEDIA/BV/26
Test objective	Verify compliancy of the Auto MDI sync status and resulting data rate speed operation through the fibre with a length of 50 metres with 5 bends for 1 Gbps media converter & 100 Mbps/1 Gbps media converter link.
Initial situation	
POF cable cut with a dedicated cutting tool. Correct coupling of the POF cable with the MDI interface clamping. A POF cable segment, length of 50 metres, with fibre diameter (including jacket) included between 1,5 and 2,2 mm. A setup with straight wires with 5 bends (2,5 loops). Bends should be of radius 12 mm. All bends should have the same diameter. Two POF active equipment with connector less MDI interface: one 1 Gbps media converter and one 100 Mbps/1 Gbps media converter.	
Expected behaviour	
Connecting the POF cable to the equipment MDI interfaces. When both POF active equipment will have their respective transmit (TX) and receive (RX) interfaces connected to each other, PHY and MAC Ethernet protocol layers should operate normally even in the presence of cable bends across the POF cable path.	
Final situation	
The link status of the media converters should both indicate correct sync state. The data rate speed operation status should be 1 Gbps on both equipment interfaces.	

TP ID	TP/POF/SAT/MEDIA/BV/27
Test objective	Verify compliancy of the Auto MDI sync status and resulting data rate speed operation through the fibre with a length of 100 metres with 5 bends for 1 Gbps media converter & 100 Mbps/1 Gbps media converter link.
Initial situation	
POF cable cut with a dedicated cutting tool. Correct coupling of the POF cable with the MDI interface clamping. A POF cable segment, length of 100 metres, with fibre diameter (including jacket) included between 1,5 and 2,2 mm. A setup with straight wires with 5 bends (2,5 loops). Bends should be of radius 12 mm. All bends should have the same diameter. Two POF active equipment with connector less MDI interface: one 1 Gbps media converter and one 100 Mbps/1 Gbps media converter.	
Expected behaviour	
Connecting the POF cable to the equipment MDI interfaces. When both POF active equipment will have their respective transmit (TX) and receive (RX) interfaces connected to each other, PHY and MAC Ethernet protocol layers should operate normally even in the presence of cable bends across the POF cable path.	
Final situation	
The link status of the media converters should both indicate correct sync state. The data rate speed operation status should be 1 Gbps on both equipment interfaces.	

TP ID	TP/POF/SAT/MEDIA/BV/28
Test objective	Verify compliancy of the Auto MDI sync status and resulting data rate speed operation through the fibre with a length of 10 metres with 10 bends for 1 Gbps media converter & 100 Mbps/1 Gbps media converter link.
Initial situation	
POF cable cut with a dedicated cutting tool. Correct coupling of the POF cable with the MDI interface clamping. A POF cable segment, length of 10 metres, with fibre diameter (including jacket) included between 1,5 and 2,2 mm. A setup with straight wires with 10 bends (5 loops). Bends should be of radius 12 mm. All bends should have the same diameter. Two POF active equipment with connector less MDI interface: one 1 Gbps media converter and one 100 Mbps/1 Gbps media converter.	
Expected behaviour	
Connecting the POF cable to the equipment MDI interfaces. When both POF active equipment will have their respective transmit (TX) and receive (RX) interfaces connected to each other, PHY and MAC Ethernet protocol layers should operate normally even in the presence of cable bends across the POF cable path.	
Final situation	
The link status of the media converters should both indicate correct sync state. The data rate speed operation status should be 1 Gbps on both equipment interfaces.	

TP ID	TP/POF/SAT/MEDIA/BV/29
Test objective	Verify compliancy of the Auto MDI sync status and resulting data rate speed operation through the fibre with a length of 50 metres with 10 bends for 1 Gbps media converter & 100 Mbps/1 Gbps media converter link.
Initial situation	
POF cable cut with a dedicated cutting tool. Correct coupling of the POF cable with the MDI interface clamping. A POF cable segment, length of 50 metres, with fibre diameter (including jacket) included between 1,5 and 2,2 mm. A setup with straight wires with 10 bends (5 loops). Bends should be of radius 12 mm. All bends should have the same diameter. Two POF active equipment with connector less MDI interface: one 1 Gbps media converter and one 100 Mbps/1 Gbps media converter.	
Expected behaviour	
Connecting the POF cable to the equipment MDI interfaces. When both POF active equipment will have their respective transmit (TX) and receive (RX) interfaces connected to each other, PHY and MAC Ethernet protocol layers should operate normally even in the presence of cable bends across the POF cable path.	
Final situation	
The link status of the media converters should both indicate correct sync state. The data rate speed operation status should be 1 Gbps on both equipment interfaces.	

TP ID	TP/POF/SAT/MEDIA/BV/30
Test objective	Verify compliancy of the Auto MDI sync status and resulting data rate speed operation through the fibre with a length of 100 metres with 10 bends for 1 Gbps media converter & 100 Mbps/1 Gbps media converter link.
Initial situation	
POF cable cut with a dedicated cutting tool. Correct coupling of the POF cable with the MDI interface clamping. A POF cable segment, length of 100 metres, with fibre diameter (including jacket) included between 1,5 and 2,2 mm. A setup with straight wires with 10 bends (5 loops). Bends should be of radius 12 mm. All bends should have the same diameter. Two POF active equipment with connector less MDI interface: one 1 Gbps media converter and one 100 Mbps/1 Gbps media converter.	
Expected behaviour	
Connecting the POF cable to the equipment MDI interfaces. When both POF active equipment will have their respective transmit (TX) and receive (RX) interfaces connected to each other, PHY and MAC Ethernet protocol layers should operate normally even in the presence of cable bends across the POF cable path.	
Final situation	
The link status of the media converters should both indicate correct sync state. The data rate speed operation status should be 1 Gbps on both equipment interfaces.	

=100 Mbps interfaces; damage; no injury=

TP ID	TP/POF/SAT/MEDIA/BV/31
Test objective	Verify loss of compliancy of the Auto MDI sync status and resulting data rate speed operation through the fibre with a length of 10 metres without any bends for two 100 Mbps media converters link when POF cable is damaged (chew, crush or torsion without an injury to the cable jacket).
Initial situation	
POF cable cut with a dedicated cutting tool. Correct coupling of the POF cable with the MDI interface clamping. A POF cable segment, length of 10 metres, with fibre diameter (including jacket) included between 1,5 and 2,2 mm. A setup with straight wires without any bends. Two POF active equipment with connector less MDI interface: two 100 Mbps media converters.	
Expected behaviour	
Setup the operation with a damage without an injury on the POF cable: firmly chew, crush or apply a strong torsion the cable anywhere without breaking the cable jacket (not making the fibre core visible). Connecting the POF cable to the equipment MDI interfaces. When both POF active equipment will have their respective transmit (TX) and receive (RX) interfaces connected to each other, PHY and MAC Ethernet protocol layers should operate normally. Data rate speed operation should remain at operation at 100 Mbps link.	
Final situation	
The link status of the media converters should both indicate correct sync state. The data rate speed operation status should be at 100 Mbps on both equipment interfaces and the link should not be lost.	

=1 Gbps interfaces; damage; no injury=

TP ID	TP/POF/SAT/MEDIA/BV/32
Test objective	Verify loss of compliancy of the Auto MDI sync status and resulting data rate speed operation through the fibre with a length of 10 metres without any bends for two 1 Gbps media converters link when POF cable is damaged (chew, crush or torsion without an injury on the cable jacket).
Initial situation	
POF cable cut with a dedicated cutting tool. Correct coupling of the POF cable with the MDI interface clamping. A POF cable segment, length of 10 metres, with fibre diameter (including jacket) included between 1,5 and 2,2 mm. A setup with straight wires without any bends. Two POF active equipment with connector less MDI interface: two 1 Gbps media converters.	
Expected behaviour	
Setup the operation with a damage without an injury on the POF cable: firmly chew, crush or apply a strong torsion the cable anywhere without breaking the cable jacket (not making the fibre core visible). Connecting the POF cable to the equipment MDI interfaces. When both POF active equipment will have their respective transmit (TX) and receive (RX) interfaces connected to each other, PHY and MAC Ethernet protocol layers should operate normally. Data rate speed operation should remain at operation at 1 Gbps link.	
Final situation	
The link status of the media converters should both indicate correct sync state. The data rate speed operation status should be at 1 Gbps on both equipment interfaces and the link should not be lost.	

=100 Mbps/1 Gbps interfaces; damage; no injury=

TP ID	TP/POF/SAT/MEDIA/BV/33
Test objective	Verify loss of compliancy of the Auto MDI sync status and resulting data rate speed operation through the fibre with a length of 10 metres without any bends for two 100 Mbps/1 Gbps media converters link when POF cable is damaged (chew, crush or torsion without an injury on the cable jacket).
Initial situation	
POF cable cut with a dedicated cutting tool. Correct coupling of the POF cable with the MDI interface clamping. A POF cable segment, length of 10 metres, with fibre diameter (including jacket) included between 1,5 and 2,2 mm. A setup with straight wires without any bends. Two POF active equipment with connector less MDI interface: two 100 Mbps/1 Gbps media converters.	
Expected behaviour	
Setup the operation with a damage without an injury on the POF cable: firmly chew, crush or apply a strong torsion the cable anywhere without breaking the cable jacket (not making the fibre core visible). Connecting the POF cable to the equipment MDI interfaces. When both POF active equipment will have their respective transmit (TX) and receive (RX) interfaces connected to each other, PHY and MAC Ethernet protocol layers should operate normally. Data rate speed operation should remain at operation at 1 Gbps link.	
Final situation	
The link status of the media converters should both indicate correct sync state. The data rate speed operation status should be at 1 Gbps on both equipment interfaces and the link should not be lost.	

=100 Mbps & 100 Mbps/1 Gbps interfaces; damage; no injury=

TP ID	TP/POF/SAT/MEDIA/BV/34
Test objective	Verify loss of compliancy of the Auto MDI sync status and resulting data rate speed operation through the fibre with a length of 10 metres without any bends for one 100 Mbps media converter and one 100 Mbps/1 Gbps media converter. link when POF cable is damaged (chew, crush or torsion without an injury on the cable jacket).
Initial situation	
POF cable cut with a dedicated cutting tool. Correct coupling of the POF cable with the MDI interface clamping. A POF cable segment, length of 10 metres, with fibre diameter (including jacket) included between 1.5 and 2,2 mm. A setup with straight wires without any bends. Two POF active equipment with connector less MDI interface: one 100 Mbps media converter and 100 Mbps/1 Gbps media converters.	
Expected behaviour	
Setup the operation with a damage without an injury on the POF cable: firmly chew, crush or apply a strong torsion the cable anywhere without breaking the cable jacket (not making the fibre core visible). Connecting the POF cable to the equipment MDI interfaces. When both POF active equipment will have their respective transmit (TX) and receive (RX) interfaces connected to each other, PHY and MAC Ethernet protocol layers should operate normally. Data rate speed operation should remain at operation at 100 Mbps link.	
Final situation	
The link status of the media converters should both indicate correct sync state. The data rate speed operation status should be at 100 Mbps on both equipment interfaces and the link should not be lost.	

=1 Gbps & 100 Mbps/1 Gbps interfaces; damage; no injury=

TP ID	TP/POF/SAT/MEDIA/BV/35
Test objective	Verify loss of compliancy of the Auto MDI sync status and resulting data rate speed operation through the fibre with a length of 10 metres without any bends for one 1 Gbps media converter and one 100 Mbps/1 Gbps media converter link when POF cable is damaged (chew, crush or torsion without an injury on the cable jacket).
Initial situation	
POF cable cut with a dedicated cutting tool. Correct coupling of the POF cable with the MDI interface clamping. A POF cable segment, length of 10 metres, with fibre diameter (including jacket) included between 1,5 and 2,2 mm. A setup with straight wires without any bends. Two POF active equipment with connector less MDI interface: one 1 Gbps media converter and 100 Mbps/1 Gbps media converters.	
Expected behaviour	
Setup the operation with a damage without an injury on the POF cable: firmly chew, crush or apply a strong torsion the cable anywhere without breaking the cable jacket (not making the fibre core visible). Connecting the POF cable to the equipment MDI interfaces. When both POF active equipment will have their respective transmit (TX) and receive (RX) interfaces connected to each other, PHY and MAC Ethernet protocol layers should operate normally. Data rate speed operation should remain at operation at 1 Gbps link.	
Final situation	
The link status of the media converters should both indicate correct sync state. The data rate speed operation status should be at 1 Gbps on both equipment interfaces and the link should not be lost.	

4.5.2.4 SEMI ACTIVE - TP/POF/SAT/MEDIA/BI

=100 Mbps interfaces; bending=

TP ID	TP/POF/SAT/MEDIA/BI/01
Test objective	Verify non-compliancy of the Auto MDI sync status and resulting data rate speed operation through the fibre with a length of 50 metres with 30 bends for two 100 Mbps media converters link.
Initial situation	
POF cable cut with a dedicated cutting tool. Correct coupling of the POF cable with the MDI interface clamping. A POF cable segment, length of 50 metres, with fibre diameter (including jacket) included between 1,5 and 2,2 mm. A setup with straight wires with 30 bends. Bends should be of radius 12 mm. All bends should have the same diameter. Two POF active equipment with connector less MDI interface: two 100 Mbps media converters.	
Expected behaviour	
Connecting the POF cable to the equipment MDI interfaces. When both POF active equipment will have their respective transmit (TX) and receive (RX) interfaces connected to each other, PHY and MAC Ethernet protocol layers should not operate normally. Data rate speed operation should result at no link.	
Final situation	
The link status of the media converters should both indicate incorrect sync state. The data rate speed operation status should be undefined on both equipment interfaces.	

=1 Gbps interfaces; bending=

TP ID	TP/POF/SAT/MEDIA/BI/02
Test objective	Verify non-compliancy of the Auto MDI sync status and resulting data rate speed operation through the fibre with a length of 50 metres with 30 bends for two 1 Gbps media converters link.
Initial situation	
POF cable cut with a dedicated cutting tool. Correct coupling of the POF cable with the MDI interface clamping. A POF cable segment, length of 50 metres, with fibre diameter (including jacket) included between 1,5 and 2,2 mm. A setup with straight wires with 30 bends. Bends should be of radius 12 mm. All bends should have the same diameter. Two POF active equipment with connector less MDI interface: two 1 Gbps media converters.	
Expected behaviour	
Connecting the POF cable to the equipment MDI interfaces. When both POF active equipment will have their respective transmit (TX) and receive (RX) interfaces connected to each other, PHY and MAC Ethernet protocol layers should not operate normally. Data rate speed operation should result at no link.	
Final situation	
The link status of the media converters should both indicate incorrect sync state. The data rate speed operation status should be undefined on both equipment interfaces.	

=100 Mbps/1 Gbps interfaces; bending =

TP ID	TP/POF/SAT/MEDIA/BI/03
Test objective	Verify non-compliancy of the Auto MDI sync status and resulting data rate speed operation through the fibre with a length of 50 metres with 30 bends for two 100 Mbps/1 Gbps media converters link.
Initial situation	
POF cable cut with a dedicated cutting tool. Correct coupling of the POF cable with the MDI interface clamping. A POF cable segment, length of 50 metres, with fibre diameter (including jacket) included between 1,5 and 2,2 mm. A setup with straight wires with 30 bends. Bends should be of radius 12 mm. All bends should have the same diameter. Two POF active equipment with connector less MDI interface: two 100 Mbps/1 Gbps media converters.	
Expected behaviour	
Connecting the POF cable to the equipment MDI interfaces. When both POF active equipment will have their respective transmit (TX) and receive (RX) interfaces connected to each other, PHY and MAC Ethernet protocol layers should not operate normally. Data rate speed operation should result at no link.	
Final situation	
The link status of the media converters should both indicate incorrect sync state. The data rate speed operation status should be undefined on both equipment interfaces.	

=100 Mbps & 100 Mbps/1 Gbps interfaces; bending =

TP ID	TP/POF/SAT/MEDIA/BI/04
Test objective	Verify non-compliancy of the Auto MDI sync status and resulting data rate speed operation through the fibre with a length of 50 metres with 30 bends for one 100 Mbps converters and one 100 Mbps/1 Gbps media converters link.
Initial situation	
POF cable cut with a dedicated cutting tool. Correct coupling of the POF cable with the MDI interface clamping. A POF cable segment, length of 50 metres, with fibre diameter (including jacket) included between 1,5 and 2,2 mm. A setup with straight wires with 30 bends. Bends should be of radius 12 mm. All bends should have the same diameter. Two POF active equipment with connector less MDI interface: one 100 Mbps media converter and one 100 Mbps/1 Gbps media converter.	
Expected behaviour	
Connecting the POF cable to the equipment MDI interfaces. When both POF active equipment will have their respective transmit (TX) and receive (RX) interfaces connected to each other, PHY and MAC Ethernet protocol layers should not operate normally. Data rate speed operation should result at no link.	
Final situation	
The link status of the media converters should both indicate incorrect sync state. The data rate speed operation status should be undefined on both equipment interfaces.	

=1 Gbps & 100 Mbps/1 Gbps interfaces; bending =

TP ID	TP/POF/SAT/MEDIA/BI/05
Test objective	Verify non-compliancy of the Auto MDI sync status and resulting data rate speed operation through the fibre with a length of 50 metres with 30 bends for one 1 Gbps media converters and 100 Mbps/1 Gbps media converters link.
Initial situation	
POF cable cut with a dedicated cutting tool. Correct coupling of the POF cable with the MDI interface clamping. A POF cable segment, length of 50 metres, with fibre diameter (including jacket) included between 1,5 and 2,2 mm. A setup with straight wires with 30 bends. Bends should be of radius 12 mm. All bends should have the same diameter. Two POF active equipment with connector less MDI interface: one 1 Gbps media converter and one 100 Mbps/1 Gbps media converter.	
Expected behaviour	
Connecting the POF cable to the equipment MDI interfaces. When both POF active equipment will have their respective transmit (TX) and receive (RX) interfaces connected to each other, PHY and MAC Ethernet protocol layers should not operate normally. Data rate speed operation should result at no link.	
Final situation	
The link status of the media converters should both indicate incorrect sync state. The data rate speed operation status should be undefined on both equipment interfaces.	

=100 Mbps interfaces; damage; injury=

TP ID	TP/POF/SAT/MEDIA/BI/06
Test objective	Verify loss of compliancy of the Auto MDI sync status and resulting data rate speed operation through the fibre with a length of 50 metres without any bends for two 100 Mbps media converters link when POF cable is damaged (chew, crush or torsion with an injury on the cable jacket).
Initial situation	
POF cable cut with a dedicated cutting tool. Correct coupling of the POF cable with the MDI interface clamping. A POF cable segment, length of 50 metres, with fibre diameter (including jacket) included between 1,5 and 2,2 mm. A setup with straight wires without any bends. Two POF active equipment with connector less MDI interface: two 100 Mbps media converters.	
Expected behaviour	
Setup the operation with an injury on the POF cable: firmly chew, crush or apply a strong torsion the cable anywhere and scrap the cable jacket (making the fibre core visible). Connecting the POF cable to the equipment MDI interfaces. When both POF active equipment will have their respective transmit (TX) and receive (RX) interfaces connected to each other, PHY and MAC Ethernet protocol layers should not operate normally. Data rate speed operation should result in a lost link. Some light exits at the damage location as fibre core is visible.	
Final situation	
The link status of the media converters should both indicate incorrect sync state. The data rate speed operation status should be undefined on both equipment interfaces and the link should be lost.	

=1 Gbps interfaces; damage; injury=

TP ID	TP/POF/SAT/MEDIA/BI/07
Test objective	Verify loss of compliancy of the Auto MDI sync status and resulting data rate speed operation through the fibre with a length of 50 metres without any bends for two 1 Gbps media converters link when POF cable is damaged (chew, crush or torsion with an injury on the cable jacket).
Initial situation	
POF cable cut with a dedicated cutting tool. Correct coupling of the POF cable with the MDI interface clamping. A POF cable segment, length of 50 metres, with fibre diameter (including jacket) included between 1,5 and 2,2 mm. A setup with straight wires without any bends. Two POF active equipment with connector less MDI interface: two 100 Mbps/1 Gbps media converters.	
Expected behaviour	
Setup the operation with an injury on the POF cable: firmly chew, crush or apply a strong torsion the cable anywhere and scrap the cable jacket (making the fibre core visible). Connecting the POF cable to the equipment MDI interfaces. When both POF active equipment will have their respective transmit (TX) and receive (RX) interfaces connected to each other, PHY and MAC Ethernet protocol layers should not operate normally. Data rate speed operation should result in a lost link. Some light exits at the damage location as fibre core is visible.	
Final situation	
The link status of the media converters should both indicate incorrect sync state. The data rate speed operation status should be undefined on both equipment interfaces and the link should be lost.	

=100 Mbps/1 Gbps interfaces; damage; injury=

TP ID	TP/POF/SAT/MEDIA/BI/08
Test objective	Verify loss of compliancy of the Auto MDI sync status and resulting data rate speed operation through the fibre with a length of 50 metres without any bends for two 100 Mbps/1 Gbps media converters link when POF cable is damaged (chew, crush or torsion with an injury on the cable jacket).
Initial situation	
POF cable cut with a dedicated cutting tool. Correct coupling of the POF cable with the MDI interface clamping. A POF cable segment, length of 50 metres, with fibre diameter (including jacket) included between 1,5 and 2,2 mm. A setup with straight wires without any bends. Two POF active equipment with connector less MDI interface: two 100 Mbps/1 Gbps media converters.	
Expected behaviour	
Setup the operation with an injury on the POF cable: firmly chew, crush or apply a strong torsion the cable anywhere and scrap the cable jacket (making the fibre core visible). Connecting the POF cable to the equipment MDI interfaces. When both POF active equipment will have their respective transmit (TX) and receive (RX) interfaces connected to each other, PHY and MAC Ethernet protocol layers should not operate normally. Data rate speed operation should result in a lost link. Some light exits at the damage location as fibre core is visible.	
Final situation	
The link status of the media converters should both indicate incorrect sync state. The data rate speed operation status should be undefined on both equipment interfaces and the link should be lost.	

=100 Mbps & 100 Mbps/1 Gbps interfaces; damage; injury=

TP ID	TP/POF/SAT/MEDIA/BI/09
Test objective	Verify loss of compliancy of the Auto MDI sync status and resulting data rate speed operation through the fibre with a length of 50 metres without any bends for one 100 Mbps media converter and one 100 Mbps/1 Gbps media converter link when POF cable is damaged (chew, crush or torsion with an injury on the cable jacket).
Initial situation	
POF cable cut with a dedicated cutting tool. Correct coupling of the POF cable with the MDI interface clamping. A POF cable segment, length of 50 metres, with fibre diameter (including jacket) included between 1,5 and 2,2 mm. A setup with straight wires without any bends. Two POF active equipment with connector less MDI interface: one 100 Mbps media converter and 100 Mbps/1 Gbps media converters .	
Expected behaviour	
Setup the operation with an injury on the POF cable: firmly chew, crush or apply a strong torsion the cable anywhere and scrap the cable jacket (making the fibre core visible). Connecting the POF cable to the equipment MDI interfaces. When both POF active equipment will have their respective transmit (TX) and receive (RX) interfaces connected to each other, PHY and MAC Ethernet protocol layers should not operate normally. Data rate speed operation should result in a lost link. Some light exits at the damage location as fibre core is visible.	
Final situation	
The link status of the media converters should both indicate incorrect sync state. The data rate speed operation status should be undefined on both equipment interfaces and the link should be lost.	

=1 Gbps & 100 Mbps/1 Gbps interfaces; damage; injury=

TP ID	TP/POF/SAT/MEDIA/BI/10
Test objective	Verify loss of compliancy of the Auto MDI sync status and resulting data rate speed operation through the fibre with a length of 50 metres without any bends for one 1 Gbps media converter and one 100 Mbps/1 Gbps media converter link when POF cable is damaged (chew, crush or torsion with an injury on the cable jacket).
Initial situation	
POF cable cut with a dedicated cutting tool. Correct coupling of the POF cable with the MDI interface clamping. A POF cable segment, length of 50 metres, with fibre diameter (including jacket) included between 1,5 and 2,2 mm. A setup with straight wires without any bends. Two POF active equipment with connector less MDI interface: one 1 Gbps media converter and 100 Mbps/1 Gbps media converters.	
Expected behaviour	
Setup the operation with an injury on the POF cable: firmly chew, crush or apply a strong torsion the cable anywhere and scrap the cable jacket (making the fibre core visible). When both POF active equipment will have their respective transmit (TX) and receive (RX) interfaces connected to each other, PHY and MAC Ethernet protocol layers should not operate normally. Data rate speed operation should result in a lost link. Some light exits at the damage location as fibre core is visible.	
Final situation	
The link status of the media converters should both indicate incorrect sync state. The data rate speed operation status should be undefined on both equipment interfaces and the link should be lost.	

4.5.3 POF Active tests

4.5.3.0 Active category

This category of tests is related to the operational impact of the media performances in various conditions (cable length, bend losses) on the application scenario defined in clause 4.1. Tests in this category involve:

- the termination of both sides of the POF cable media;
- with an active POF equipment;
- enabling one or more Internet Protocol (IP) over Ethernet network host to perform the application scenario.

An active POF equipment is from types: standalone media converter, Ethernet switch.

A test network host is a computing system which connected through Ethernet to the Plugtests POF network and which operates a TCP/IP stack and the software applications associated with the applications scenarios described in clause 4.2.

4.5.3.1 ACTIVE - TP/POF/AT/ACOMPONENT/BV

=no bending=

TP ID	TP/POF/AT/ACOMPONENT/BV/01
Test objective	Operate a high-resolution video streaming service between two IP hosts over POF 100 Mbps/1 Gbps infrastructure through fibre links with a length of 10 metres without any bends.
Initial situation	
Cutting the POF cable with a dedicated cutting tool. A POF cable segment of 10 metres with fibre diameter (including jacket) included between 1,5 and 2,2 mm. A setup with straight wires without any bends. Two POF active equipment of type media converter 100 Mbps/1 Gbps with connector less MDI interface. One POF active equipment of type media Ethernet switch 100 Mbps/1 Gbps with connector less MDI interfaces. One IP over Ethernet network host (HOST-S) to act as the streaming source configured per clause 4.2.2 and connected to the POF Ethernet switch through the first POF media converter. One IP over Ethernet network host (HOST-C) to act as the stream consumer configured per clause 4.2.2 and connected to the POF Ethernet switch through the second POF media converter.	
Expected behaviour	
Connecting the POF cable to the equipment MDI interfaces. When all POF active equipment will have their respective transmit (TX) and receive (RX) interfaces connected to each other, PHY and MAC Ethernet protocol layers should operate normally enabling IP communications between the involved network hosts. Verify IP network capability. Network Ping requests between HOST-S and HOST-C (and vice versa) should result in the reception of Ping answers, without any ICMP packet losses, associated with round trip time of 1 ms in average. Run the application scenario. Selected application scenario should run smoothly and high network bandwidth usages (up to 1 Gbps) produced by the HD/UHD video stream should be delivered.	
Final situation	
The link status of the media converters and the Ethernet Switch should all indicate correct sync state. The data rate speed operation status should be 1 Gbps on all equipment interfaces. The video stream should display on HOST-C seamlessly and fluently without any visual artefact (pixilation), providing therefore a good subjective audio visual quality.	

TP ID	TP/POF/AT/ACOMPONENT/BV/02
Test objective	Operate a heavy file transfer service between two IP hosts over POF 100 Mbps/1 Gbps infrastructure through fibre links with a length of 10 metres without any bends.
Initial situation	
Cutting the POF cable with a dedicated cutting tool. A POF cable segment of 10 metres with fibre diameter (including jacket) included between 1,5 and 2,2 mm. A setup with straight wires without any bends. Two POF active equipment of type media converter 100 Mbps/1 Gbps with connector less MDI interface. One POF active equipment of type media Ethernet switch 100 Mbps/1 Gbps with connector less MDI interfaces. One IP over Ethernet network host (HOST-S) to act as the heavy file source configured per clause 4.2.3 and connected to the POF Ethernet switch through the first POF media converter. One IP over Ethernet network host (HOST-C) to act as the heavy file destination configured per clause 4.2.3 and connected to the POF Ethernet switch through the second POF media converter.	
Expected behaviour	
Connecting the POF cable to the equipment MDI interfaces. When all POF active equipment will have their respective transmit (TX) and receive (RX) interfaces connected to each other, PHY and MAC Ethernet protocol layers should operate normally enabling IP communications between the involved network hosts. Verify IP network capability. Network Ping requests between HOST-S and HOST-C (and vice versa) should result in the reception of Ping answers, without any ICMP packet losses, associated with round trip time of 1 ms in average. Run the application scenario. Selected application scenario should run smoothly and high network bandwidth usages (up to 1 Gbps) should be reached by the heavy file transfer.	
Final situation	
The link status of the media converters and the Ethernet Switch should all indicate correct sync state. The data rate speed operation status should be 1 Gbps on all equipment interfaces. The heavy file transfer should perform seamlessly and fluently without any interruption and informed network speed on HOST-S should remain stable along the complete data transfer.	

TP ID	TP/POF/AT/ACOMPONENT/BV/03
Test objective	Operate a network traffic generator service between two IP hosts over POF 100 Mbps/1 Gbps infrastructure through fibre links with a length of 10 metres without any bends.
Initial situation	
Cutting the POF cable with a dedicated cutting tool. A POF cable segment of 10 metres with fibre diameter (including jacket) included between 1,5 and 2,2 mm. A setup with straight wires without any bends. Two POF active equipment of type media converter 100 Mbps/1 Gbps with connector less MDI interface. One POF active equipment of type media Ethernet switch 100 Mbps/1 Gbps with connector less MDI interfaces. One IP over Ethernet network host (HOST-S) to act as the network traffic generator configured per clause 4.2.4 and connected to the POF Ethernet switch through the first POF media converter. One IP over Ethernet network host (HOST-C) to act as the network simulated traffic consumer configured per clause 4.2.4 and connected to the POF Ethernet switch through the second POF media converter.	
Expected behaviour	
Connecting the POF cable to the equipment MDI interfaces. When all POF active equipment will have their respective transmit (TX) and receive (RX) interfaces connected to each other, PHY and MAC Ethernet protocol layers should operate normally enabling IP communications between the involved network hosts. Verify IP network capability. Network Ping requests between HOST-S and HOST-C (and vice versa) should result in the reception of Ping answers, without any ICMP packet losses, associated with round trip time of 1 ms in average. Run the application scenario. The application scenario should run smoothly and high network bandwidth usages (up to 1 Gbps) produced by the network traffic generator should be operated.	
Final situation	
The link status of the media converters and the Ethernet Switch should all indicate correct sync state. The data rate speed operation status should be 1 Gbps on all equipment interfaces. The data network stream should perform seamlessly and fluently without any interruption and informed network speeds on HOST-S and HOST-C should remain stable along the complete traffic simulation.	

TP ID	TP/POF/AT/ACOMPONENT/BV/04
Test objective	Operate a high-resolution video streaming service between two IP hosts over POF 100 Mbps/1 Gbps infrastructure through fibre links with a length of 50 metres without any bends.
Initial situation	
Cutting the POF cable with a dedicated cutting tool. A POF cable segment of 50 metres with fibre diameter (including jacket) included between 1,5 and 2,2 mm. A setup with straight wires without any bends. Two POF active equipment of type media converter 100 Mbps/1 Gbps with connector less MDI interface. One POF active equipment of type media Ethernet switch 100 Mbps/1 Gbps with connector less MDI interfaces. One IP over Ethernet network host (HOST-S) to act as the streaming source configured per clause 4.2.2 and connected to the POF Ethernet switch through the first POF media converter. One IP over Ethernet network host (HOST-C) to act as the stream consumer configured per clause 4.2.2 and connected to the POF Ethernet switch through the second POF media converter.	
Expected behaviour	
Connecting the POF cable to the equipment MDI interfaces. When all POF active equipment will have their respective transmit (TX) and receive (RX) interfaces connected to each other, PHY and MAC Ethernet protocol layers should operate normally enabling IP communications between the involved network hosts. Verify IP network capability. Network Ping requests between HOST-S and HOST-C (and vice versa) should result in the reception of Ping answers, without any ICMP packet losses, associated with round trip time of 1 ms in average. Run the application scenario. Selected application scenario should run smoothly and high network bandwidth usages (up to 1 Gbps) produced by the HD/UHD video stream should be delivered.	
Final situation	
The link status of the media converters and the Ethernet Switch should all indicate correct sync state. The data rate speed operation status should be 1 Gbps on all equipment interfaces. The video stream should display on HOST-C seamlessly and fluently without any visual artefact (pixilation), providing therefore a good subjective audio visual quality.	

TP ID	TP/POF/AT/ACOMPONENT/BV/05
Test objective	Operate a heavy file transfer service between two IP hosts over POF 100 Mbps/1 Gbps infrastructure through fibre links with a length of 50 metres without any bends.
Initial situation	
Cutting the POF cable with a dedicated cutting tool. A POF cable segment of 50 metres with fibre diameter (including jacket) included between 1,5 and 2,2 mm. A setup with straight wires without any bends. Two POF active equipment of type media converter 100 Mbps/1 Gbps with connector less MDI interface. One POF active equipment of type media Ethernet switch 100 Mbps/1 Gbps with connector less MDI interfaces. One IP over Ethernet network host (HOST-S) to act as the heavy file source configured per clause 4.2.3 and connected to the POF Ethernet switch through the first POF media converter. One IP over Ethernet network host (HOST-C) to act as the heavy file destination configured per clause 4.2.3 and connected to the POF Ethernet switch through the second POF media converter.	
Expected behaviour	
Connecting the POF cable to the equipment MDI interfaces. When all POF active equipment will have their respective transmit (TX) and receive (RX) interfaces connected to each other, PHY and MAC Ethernet protocol layers should operate normally enabling IP communications between the involved network hosts. Verify IP network capability. Network Ping requests between HOST-S and HOST-C (and vice versa) should result in the reception of Ping answers, without any ICMP packet losses, associated with round trip time of 1 ms in average. Run the application scenario. Selected application scenario should run smoothly and high network bandwidth usages (up to 1 Gbps) should be reached by the heavy file transfer.	
Final situation	
The link status of the media converters and the Ethernet Switch should all indicate correct sync state. The data rate speed operation status should be 1 Gbps on all equipment interfaces. The heavy file transfer should perform seamlessly and fluently without any interruption and informed network speed on HOST-S should remain stable along the complete data transfer.	

TP ID	TP/POF/AT/ACOMPONENT/BV/06
Test objective	Operate a network traffic generator service between two IP hosts over POF 100 Mbps/1 Gbps infrastructure through fibre links with a length of 50 metres without any bends.
Initial situation	
Cutting the POF cable with a dedicated cutting tool. A POF cable segment of 50 metres with fibre diameter (including jacket) included between 1,5 and 2,2 mm. A setup with straight wires without any bends. Two POF active equipment of type media converter 100 Mbps/1 Gbps with connector less MDI interface. One POF active equipment of type media Ethernet switch 100 Mbps/1 Gbps with connector less MDI interfaces. One IP over Ethernet network host (HOST-S) to act as the network traffic generator configured per clause 4.2.4 and connected to the POF Ethernet switch through the first POF media converter. One IP over Ethernet network host (HOST-C) to act as the network simulated traffic consumer configured per clause 4.2.4 and connected to the POF Ethernet switch through the second POF media converter.	
Expected behaviour	
Connecting the POF cable to the equipment MDI interfaces. When all POF active equipment will have their respective transmit (TX) and receive (RX) interfaces connected to each other, PHY and MAC Ethernet protocol layers should operate normally enabling IP communications between the involved network hosts. Verify IP network capability. Network Ping requests between HOST-S and HOST-C (and vice versa) should result in the reception of Ping answers, without any ICMP packet losses, associated with round trip time of 1 ms in average. Run the application scenario. The application scenario should run smoothly and high network bandwidth usages (up to 1 Gbps) produced by the network traffic generator should be supported.	
Final situation	
The link status of the media converters and the Ethernet Switch should all indicate correct sync state. The data rate speed operation status should be 1 Gbps on all equipment interfaces. The data network stream should perform seamlessly and fluently without any interruption and informed network speeds on HOST-S and HOST-C should remain stable along the complete traffic simulation.	

TP ID	TP/POF/AT/ACOMPONENT/BV/07
Test objective	Operate a high-resolution video streaming service between two IP hosts over POF 100 Mbps/1 Gbps infrastructure through fibre links with a length of 100 metres without any bends.
Initial situation	
Cutting the POF cable with a dedicated cutting tool. A POF cable segment of 100 metres with fibre diameter (including jacket) included between 1,5 and 2,2 mm. A setup with straight wires without any bends. Two POF active equipment of type media converter 100 Mbps/1 Gbps with connector less MDI interface. One POF active equipment of type media Ethernet switch 100 Mbps/1 Gbps with connector less MDI interfaces. One IP over Ethernet network host (HOST-S) to act as the streaming source configured per clause 4.2.2 and connected to the POF Ethernet switch through the first POF media converter. One IP over Ethernet network host (HOST-C) to act as the stream consumer configured per clause 4.2.2 and connected to the POF Ethernet switch through the second POF media converter.	
Expected behaviour	
Connecting the POF cable to the equipment MDI interfaces. When all POF active equipment will have their respective transmit (TX) and receive (RX) interfaces connected to each other, PHY and MAC Ethernet protocol layers should operate normally enabling IP communications between the involved network hosts. Verify IP network capability. Network Ping requests between HOST-S and HOST-C (and vice versa) should result in the reception of Ping answers, without any ICMP packet losses, associated with round trip time of 1 ms in average. Run the application scenario. Selected application scenario should run smoothly and high network bandwidth usages (up to 0,5 Gbps) produced by the HD/UHD video stream should be delivered.	
Final situation	
The link status of the media converters and the Ethernet Switch should all indicate correct sync state. The data rate speed operation status should be 1 Gbps on all equipment. The video stream should display on HOST-C seamlessly and fluently without any visual artefact (pixilation), providing therefore a good subjective audio visual quality.	

TP ID	TP/POF/AT/ACOMPONENT/BV/08
Test objective	Operate a heavy file transfer service between two IP hosts over POF 100 Mbps/1 Gbps infrastructure through fibre links with a length of 100 metres without any bends.
Initial situation	
Cutting the POF cable with a dedicated cutting tool. A POF cable segment of 100 metres with fibre diameter (including jacket) included between 1,5 and 2,2 mm. A setup with straight wires without any bends. Two POF active equipment of type media converter 100 Mbps/1 Gbps with connector less MDI interface. One POF active equipment of type media Ethernet switch 100 Mbps/1 Gbps with connector less MDI interfaces. One IP over Ethernet network host (HOST-S) to act as the heavy file source configured per clause 4.2.3 and connected to the POF Ethernet switch through the first POF media converter. One IP over Ethernet network host (HOST-C) to act as the heavy file destination configured per clause 4.2.3 and connected to the POF Ethernet switch through the second POF media converter.	
Expected behaviour	
Connecting the POF cable to the equipment MDI interfaces. When all POF active equipment will have their respective transmit (TX) and receive (RX) interfaces connected to each other, PHY and MAC Ethernet protocol layers should operate normally enabling IP communications between the involved network hosts. Verify IP network capability. Network Ping requests between HOST-S and HOST-C (and vice versa) should result in the reception of Ping answers, without any ICMP packet losses, associated with round trip time of 1 ms in average. Run the application scenario. Selected application scenario should run smoothly and high network bandwidth usages (up to 0,5 Gbps) should be reached by the heavy file transfer.	
Final situation	
The link status of the media converters and the Ethernet Switch should all indicate correct sync state. The data rate speed operation status should be 1 Gbps on all equipment interfaces. The heavy file transfer should perform seamlessly and fluently without any interruption and informed network speed on HOST-S should remain stable along the complete data transfer.	

TP ID	TP/POF/AT/ACOMPONENT/BV/09
Test objective	Operate a network traffic generator service between two IP hosts over POF 100 Mbps/1 Gbps infrastructure through fibre links with a length of 100 metres without any bends.
Initial situation	
Cutting the POF cable with a dedicated cutting tool. A POF cable segment of 100 metres with fibre diameter (including jacket) included between 1,5 and 2,2 mm. A setup with straight wires without any bends. Two POF active equipment of type media converter 100 Mbps/1 Gbps with connector less MDI interface. One POF active equipment of type media Ethernet switch 100 Mbps/1 Gbps with connector less MDI interfaces. One IP over Ethernet network host (HOST-S) to act as the network traffic generator configured per clause 4.2.4 and connected to the POF Ethernet switch through the first POF media converter. One IP over Ethernet network host (HOST-C) to act as the network simulated traffic consumer configured per clause 4.2.4 and connected to the POF Ethernet switch through the second POF media converter.	
Expected behaviour	
Connecting the POF cable to the equipment MDI interfaces. When all POF active equipment will have their respective transmit (TX) and receive (RX) interfaces connected to each other, PHY and MAC Ethernet protocol layers should operate normally enabling IP communications between the involved network hosts. Verify IP network capability. Network Ping requests between HOST-S and HOST-C (and vice versa) should result in the reception of Ping answers, without any ICMP packet losses, associated with round trip time of 1 ms in average. Run the application scenario. The application scenario should run smoothly and high network bandwidth usages (up to 0,5 Gbps) produced by the network traffic generator should be supported.	
Final situation	
The link status of the media converters and the Ethernet Switch should all indicate correct sync state. The data rate speed operation status should be 1 Gbps on all equipment interfaces. The data network stream should perform seamlessly and fluently without any interruption and informed network speeds on HOST-S and HOST-C should remain stable along the complete traffic simulation.	

4.5.3.2 ACTIVE - TP/POF/AT/MEDIA/BV

=bending=

TP ID	TP/POF/AT/MEDIA/BV/01
Test objective	Operate a high-resolution video streaming service between two IP hosts over POF 100 Mbps/1 Gbps infrastructure through fibre links with a length of 10 metres with 5 bends.
Initial situation	
Cutting the POF cable with a dedicated cutting tool. A POF cable segment of 10 metres with fibre diameter (including jacket) included between 1,5 and 2,2 mm. A setup with straight wires with 5 bends (2,5 loops) on one of the two cables. Bends should be of radius 12 mm. All bends should have the same diameter. Two POF active equipment of type media converter 100 Mbps/1 Gbps with connector less MDI interface. One POF active equipment of type media Ethernet switch 100 Mbps/1 Gbps with connector less MDI interfaces. One IP over Ethernet network host (HOST-S) to act as the streaming source configured per clause 4.2.2 and connected to the POF Ethernet switch through the first POF media converter. One IP over Ethernet network host (HOST-C) to act as the stream consumer configured per clause 4.2.2 and connected to the POF Ethernet switch through the second POF media converter.	
Expected behaviour	
Connecting the POF cable to the equipment MDI interfaces. When all POF active equipment will have their respective transmit (TX) and receive (RX) interfaces connected to each other, PHY and MAC Ethernet protocol layers should operate normally enabling IP communications between the involved network hosts. Verify IP network capability. Network Ping requests between HOST-S and HOST-C (and vice versa) should result in the reception of Ping answers, without any ICMP packet losses, associated with round trip time of 1 ms in average. Run the application scenario. Inserting 5 bends across the POF cable path should still permit application scenario to run smoothly and high network bandwidth usages (up to 1 Gbps) produced by the HD/UHD video stream to be delivered.	
Final situation	
The link status of the media converters and the Ethernet Switch should all indicate correct sync state. The data rate speed operation status should be 1 Gbps on all equipment interfaces. The video stream should display on HOST-C seamlessly and fluently without any visual artefact (pixilation), providing therefore a good subjective audio visual quality.	

TP ID	TP/POF/AT/MEDIA/BV/02
Test objective	Operate a heavy file transfer service between two IP hosts over POF 100 Mbps/1 Gbps infrastructure through fibre links with a length of 10 metres with 5 bends.
Initial situation	
Cutting the POF cable with a dedicated cutting tool. A POF cable segment of 10 metres with fibre diameter (including jacket) included between 1,5 and 2,2 mm. A setup with straight wires with 5 bends (2,5 loops) on one of the two cables. Bends should be of radius 12 mm. All bends should have the same diameter. Two POF active equipment of type media converter 100 Mbps/1 Gbps with connector less MDI interface. One POF active equipment of type media Ethernet switch 100 Mbps/1 Gbps with connector less MDI interfaces. One IP over Ethernet network host (HOST-S) to act as the heavy file source configured per clause 4.2.3 and connected to the POF Ethernet switch through the first POF media converter. One IP over Ethernet network host (HOST-C) to act as the heavy file destination configured per clause 4.2.3 and connected to the POF Ethernet switch through the second POF media converter.	
Expected behaviour	
Connecting the POF cable to the equipment MDI interfaces. When all POF active equipment will have their respective transmit (TX) and receive (RX) interfaces connected to each other, PHY and MAC Ethernet protocol layers should operate normally enabling IP communications between the involved network hosts. Verify IP network capability. Network Ping requests between HOST-S and HOST-C (and vice versa) should result in the reception of Ping answers, without any ICMP packet losses, associated with round trip time of 1 ms in average. Run the application scenario. Inserting 5 bends across the POF cable path should still permit application scenario to run smoothly and high network bandwidth usages (up to 1 Gbps) generated by the heavy file transfer to be realized.	
Final situation	
The link status of the media converters and the Ethernet Switch should all indicate correct sync state. The data rate speed operation status should be 1 Gbps on all equipment interfaces. The heavy file transfer should perform seamlessly and fluently without any interruption and informed network speed on HOST-S should remain stable along the complete data transfer.	

TP ID	TP/POF/AT/MEDIA/BV/03
Test objective	Operate a network traffic generator service between two IP hosts over POF 100 Mbps/1 Gbps infrastructure through fibre links with a length of 10 metres with 5 bends.
Initial situation	
Cutting the POF cable with a dedicated cutting tool. A POF cable segment of 10 metres with fibre diameter (including jacket) included between 1,5 and 2,2 mm. A setup with straight wires with 5 bends (2,5 loops) on one of the two cables. Bends should be of radius 12 mm. All bends should have the same diameter. Two POF active equipment of type media converter 100 Mbps/1 Gbps with connector less MDI interface. One POF active equipment of type media Ethernet switch 100 Mbps/1 Gbps with connector less MDI interfaces. One IP over Ethernet network host (HOST-S) to act as the network traffic generator configured per clause 4.2.4 and connected to the POF Ethernet switch through the first POF media converter. One IP over Ethernet network host (HOST-C) to act as the network simulated traffic consumer configured per clause 4.2.4 and connected to the POF Ethernet switch through the second POF media converter.	
Expected behaviour	
Connecting the POF cable to the equipment MDI interfaces. When all POF active equipment will have their respective transmit (TX) and receive (RX) interfaces connected to each other, PHY and MAC Ethernet protocol layers should operate normally enabling IP communications between the involved network hosts. Verify IP network capability. Network Ping requests between HOST-S and HOST-C (and vice versa) should result in the reception of Ping answers, without any ICMP packet losses, associated with round trip time of 1 ms in average. Run the application scenario. Inserting 5 bends across the POF cable path should still permit application scenario to run smoothly and high network bandwidth usages (up to 1 Gbps) produced by the network traffic generator to be operated.	
Final situation	
The link status of the media converters and the Ethernet Switch should all indicate correct sync state . The data rate speed operation status should be 1 Gbps on all equipment interfaces. The data network stream should perform seamlessly and fluently without any interruption and informed network speeds on HOST-S and HOST-C should remain stable along the complete traffic simulation.	

TP ID	TP/POF/AT/MEDIA/BV/04
Test objective	Operate a high-resolution video streaming service between two IP hosts over POF 100 Mbps/1 Gbps infrastructure through fibre links with a length of 10 metres with 10 bends.
Initial situation	
Cutting the POF cable with a dedicated cutting tool. A POF cable segment of 10 metres with fibre diameter (including jacket) included between 1,5 and 2,2 mm. A setup with straight wires with 10 bends (5 loops) on one of the two cables. Bends should be of radius 12 mm. All bends should have the same diameter. Two POF active equipment of type media converter 100 Mbps/1 Gbps with connector less MDI interface. One POF active equipment of type media Ethernet switch 100 Mbps/1 Gbps with connector less MDI interfaces. One IP over Ethernet network host (HOST-S) to act as the streaming source configured per clause 4.2.2 and connected to the POF Ethernet switch through the first POF media converter. One IP over Ethernet network host (HOST-C) to act as the stream consumer configured per clause 4.2.2 and connected to the POF Ethernet switch through the second POF media converter.	
Expected behaviour	
Connecting the POF cable to the equipment MDI interfaces. When all POF active equipment will have their respective transmit (TX) and receive (RX) interfaces connected to each other, PHY and MAC Ethernet protocol layers should operate normally enabling IP communications between the involved network hosts. Verify IP network capability. Network Ping requests between HOST-S and HOST-C (and vice versa) should result in the reception of Ping answers, without any ICMP packet losses, associated with round trip time of 1 ms in average. Run the application scenario. Inserting 10 bends across the POF cable path should still permit application scenario to run smoothly and high network bandwidth usages (up to 1 Gbps) produced by the HD/UHD video stream to be delivered.	
Final situation	
The link status of the media converters and the Ethernet Switch should all indicate correct sync state. The data rate speed operation status should be 1 Gbps on all equipment interfaces. The video stream should display on HOST-C seamlessly and fluently without any visual artefact (pixilation), providing therefore a good subjective audio visual quality.	

TP ID	TP/POF/AT/MEDIA/BV/05
Test objective	Operate a heavy file transfer service between two IP hosts over POF 100 Mbps/1 Gbps infrastructure through fibre links with a length of 10 metres with 10 bends.
Initial situation	
Cutting the POF cable with a dedicated cutting tool. A POF cable segment of 10 metres with fibre diameter (including jacket) included between 1,5 and 2,2 mm. A setup with straight wires with 10 bends (5 loops) on one of the two cables. Bends should be of radius 12 mm. All bends should have the same diameter. Two POF active equipment of type media converter 100 Mbps/1 Gbps with connector less MDI interface. One POF active equipment of type media Ethernet switch 100 Mbps/1 Gbps with connector less MDI interfaces. One IP over Ethernet network host (HOST-S) to act as the heavy file source configured per clause 4.2.3 and connected to the POF Ethernet switch through the first POF media converter. One IP over Ethernet network host (HOST-C) to act as the heavy file destination configured per clause 4.2.3 and connected to the POF Ethernet switch through the second POF media converter.	
Expected behaviour	
Connecting the POF cable to the equipment MDI interfaces. When all POF active equipment will have their respective transmit (TX) and receive (RX) interfaces connected to each other, PHY and MAC Ethernet protocol layers should operate normally enabling IP communications between the involved network hosts. Verify IP network capability. Network Ping requests between HOST-S and HOST-C (and vice versa) should result in the reception of Ping answers, without any ICMP packet losses, associated with round trip time of 1 ms in average. Run the application scenario. Inserting 10 bends across the POF cable path should still permit application scenario to run smoothly and high network bandwidth usages (up to 1 Gbps) generated by the heavy file transfer to be realized.	
Final situation	
The link status of the media converters and the Ethernet Switch should all indicate correct sync state. The data rate speed operation status should be 1 Gbps on all equipment interfaces. The heavy file transfer should perform seamlessly and fluently without any interruption and informed network speed on HOST-S should remain stable along the complete data transfer.	

TP ID	TP/POF/AT/MEDIA/BV/06
Test objective	Operate a network traffic generator service between two IP hosts over POF 100 Mbps/1 Gbps infrastructure through fibre links with a length of 10 metres with 10 bends.
Initial situation	
Cutting the POF cable with a dedicated cutting tool. A POF cable segment of 10 metres with fibre diameter (including jacket) included between 1,5 and 2,2 mm. A setup with straight wires with 10 bends (5 loops) on one of the two cables. Bends should be of radius 12 mm. All bends should have the same diameter. Two POF active equipment of type media converter 100 Mbps/1 Gbps with connector less MDI interface. One POF active equipment of type media Ethernet switch 100 Mbps/1 Gbps with connector less MDI interfaces. One IP over Ethernet network host (HOST-S) to act as the network traffic generator configured per clause 4.2.4 and connected to the POF Ethernet switch through the first POF media converter. One IP over Ethernet network host (HOST-C) to act as the network simulated traffic consumer configured per clause 4.2.4 and connected to the POF Ethernet switch through the second POF media converter.	
Expected behaviour	
Connecting the POF cable to the equipment MDI interfaces. When all POF active equipment will have their respective transmit (TX) and receive (RX) interfaces connected to each other, PHY and MAC Ethernet protocol layers should operate normally enabling IP communications between the involved network hosts. Verify IP network capability. Network Ping requests between HOST-S and HOST-C (and vice versa) should result in the reception of Ping answers, without any ICMP packet losses, associated with round trip time of 1 ms in average. Run the application scenario. Inserting 5 bends across the POF cable path should still permit application scenario to run smoothly and high network bandwidth usages (up to 1 Gbps) produced by the network traffic generator to be operated.	
Final situation	
The link status of the media converters and the Ethernet Switch should all indicate correct sync state. The data rate speed operation status should be 1 Gbps on all equipment interfaces. The data network stream should perform seamlessly and fluently without any interruption and informed network speeds on HOST-S and HOST-C should remain stable along the complete traffic simulation.	

TP ID	TP/POF/AT/MEDIA/BV/07
Test objective	Operate a high-resolution video streaming service between two IP hosts over POF 100 Mbps/1 Gbps infrastructure through fibre links with a length of 50 metres with 5 bends.
Initial situation	
Cutting the POF cable with a dedicated cutting tool. A POF cable segment of 50 metres with fibre diameter (including jacket) included between 1,5 and 2.2 mm. A setup with straight wires with 5 bends (2,5 loops) on one of the two cables. Bends should be of radius 12 mm. All bends should have the same diameter. Two POF active equipment of type media converter 100 Mbps/1 Gbps with connector less MDI interface. One POF active equipment of type media Ethernet switch 100 Mbps/1 Gbps with connector less MDI interfaces. One IP over Ethernet network host (HOST-S) to act as the streaming source configured per clause 4.2.2 and connected to the POF Ethernet switch through the first POF media converter. One IP over Ethernet network host (HOST-C) to act as the stream consumer configured per clause 4.2.2 and connected to the POF Ethernet switch through the second POF media converter.	
Expected behaviour	
Connecting the POF cable to the equipment MDI interfaces. When all POF active equipment will have their respective transmit (TX) and receive (RX) interfaces connected to each other, PHY and MAC Ethernet protocol layers should operate normally enabling IP communications between the involved network hosts. Verify IP network capability. Network Ping requests between HOST-S and HOST-C (and vice versa) should result in the reception of Ping answers, without any ICMP packet losses, associated with round trip time of 1 ms in average. Run the application scenario. Inserting 5 bends across the POF cable path should still permit application scenario to run smoothly and high network bandwidth usages (up to 1 Gbps) produced by the HD/UHD video stream to be delivered.	
Final situation	
The link status of the media converters and the Ethernet Switch should all indicate correct sync state. The data rate speed operation status should be 1 Gbps on all equipment interfaces. The video stream should display on HOST-C seamlessly and fluently without any visual artefact (for example pixilation), providing therefore a good subjective audio visual quality.	

TP ID	TP/POF/AT/MEDIA/BV/08
Test objective	Operate a heavy file transfer service between two IP hosts over POF 100 Mbps/1 Gbps infrastructure through fibre links with a length of 50 metres with 5 bends.
Initial situation	
Cutting the POF cable with a dedicated cutting tool. A POF cable segment of 50 metres with fibre diameter (including jacket) included between 1,5 and 2,2 mm. A setup with straight wires with 5 bends (2,5 loops) on one of the two cables. Bends should be of radius 12 mm. All bends should have the same diameter. Two POF active equipment of type media converter 100 Mbps/1 Gbps with connector less MDI interface. One POF active equipment of type media Ethernet switch 100 Mbps/1 Gbps with connector less MDI interfaces. One IP over Ethernet network host (HOST-S) to act as the heavy file source configured per clause 4.2.3 and connected to the POF Ethernet switch through the first POF media converter. One IP over Ethernet network host (HOST-C) to act as the heavy file destination configured per clause 4.2.3 and connected to the POF Ethernet switch through the second POF media converter.	
Expected behaviour	
Connecting the POF cable to the equipment MDI interfaces. When all POF active equipment will have their respective transmit (TX) and receive (RX) interfaces connected to each other, PHY and MAC Ethernet protocol layers should operate normally enabling IP communications between the involved network hosts. Verify IP network capability. Network Ping requests between HOST-S and HOST-C (and vice versa) should result in the reception of Ping answers, without any ICMP packet losses, associated with round trip time of 1 ms in average. Run the application scenario. Inserting 5 bends across the POF cable path should still permit application scenario to run smoothly and high network bandwidth usages (up to 1 Gbps) generated by the heavy file transfer to be realized.	
Final situation	
The link status of the media converters and the Ethernet Switch should all indicate correct sync state. The data rate speed operation status should be 1 Gbps on all equipment interfaces. The heavy file transfer should perform seamlessly and fluently without any interruption and informed network speed on HOST-S should remain stable along the complete data transfer.	

TP ID	TP/POF/AT/MEDIA/BV/09
Test objective	Operate a network traffic generator service between two IP hosts over POF 100 Mbps/1 Gbps infrastructure through fibre links with a length of 50 metres with 5 bends.
Initial situation	
Cutting the POF cable with a dedicated cutting tool. A POF cable segment of 50 metres with fibre diameter (including jacket) included between 1,5 and 2,2 mm. A setup with straight wires with 5 bends (2,5 loops) on one of the two cables. Bends should be of radius 12 mm. All bends should have the same diameter. Two POF active equipment of type media converter 100 Mbps/1 Gbps with connector less MDI interface. One POF active equipment of type media Ethernet switch 100 Mbps/1 Gbps with connector less MDI interfaces. One IP over Ethernet network host (HOST-S) to act as the network traffic generator configured per clause 4.2.4 and connected to the POF Ethernet switch through the first POF media converter. One IP over Ethernet network host (HOST-C) to act as the network simulated traffic consumer configured per clause 4.2.4 and connected to the POF Ethernet switch through the second POF media converter.	
Expected behaviour	
Connecting the POF cable to the equipment MDI interfaces. When all POF active equipment will have their respective transmit (TX) and receive (RX) interfaces connected to each other, PHY and MAC Ethernet protocol layers should operate normally enabling IP communications between the involved network hosts. Verify IP network capability. Network Ping requests between HOST-S and HOST-C (and vice versa) should result in the reception of Ping answers, without any ICMP packet losses, associated with round trip time of 1 ms in average. Run the application scenario. Inserting 5 bends across the POF cable path should still permit application scenario to run smoothly and high network bandwidth usages (up to 1 Gbps) produced by the network traffic generator to be operated.	
Final situation	
The link status of the media converters and the Ethernet Switch should all indicate correct sync state. The data rate speed operation status should be 1 Gbps on all equipment interfaces. The data network stream should perform seamlessly and fluently without any interruption and informed network speeds on HOST-S and HOST-C should remain stable along the complete traffic simulation.	

TP ID	TP/POF/AT/MEDIA/BV/10
Test objective	Operate a high-resolution video streaming service between two IP hosts over POF 100 Mbps/1 Gbps infrastructure through fibre links with a length of 50 metres with 10 bends.
Initial situation	
Cutting the POF cable with a dedicated cutting tool. A POF cable segment of 50 metres with fibre diameter (including jacket) included between 1,5 and 2,2 mm. A setup with straight wires with 10 bends (5 loops) on one of the two cables. Bends should be of radius 12 mm. All bends should have the same diameter. Two POF active equipment of type media converter 100 Mbps/1 Gbps with connector less MDI interface. One POF active equipment of type media Ethernet switch 100 Mbps/1 Gbps with connector less MDI interfaces. One IP over Ethernet network host (HOST-S) to act as the streaming source configured per clause 4.2.2 and connected to the POF Ethernet switch through the first POF media converter. One IP over Ethernet network host (HOST-C) to act as the stream consumer configured per clause 4.2.2 and connected to the POF Ethernet switch through the second POF media converter.	
Expected behaviour	
Connecting the POF cable to the equipment MDI interfaces. When all POF active equipment will have their respective transmit (TX) and receive (RX) interfaces connected to each other, PHY and MAC Ethernet protocol layers should operate normally enabling IP communications between the involved network hosts. Verify IP network capability. Network Ping requests between HOST-S and HOST-C (and vice versa) should result in the reception of Ping answers, without any ICMP packet losses, associated with round trip time of 1 ms in average. Run the application scenario. Inserting 10 bends across the POF cable path should still permit application scenario to run smoothly and high network bandwidth usages (up to 0,85 Gbps) produced by the HD/UHD video stream to be delivered.	
Final situation	
The link status of the media converters and the Ethernet Switch should all indicate correct sync state. The data rate speed operation status should be 1 Gbps on all equipment interfaces. The video stream should display on HOST-C seamlessly and fluently without any visual artefact (pixilation), providing therefore a good subjective audio visual quality.	

TP ID	TP/POF/AT/MEDIA/BV/11
Test objective	Operate a heavy file transfer service between two IP hosts over POF 100 Mbps/1 Gbps infrastructure through fibre links with a length of 50 metres with 10 bends.
Initial situation	
Cutting the POF cable with a dedicated cutting tool. A POF cable segment of 50 metres with fibre diameter (including jacket) included between 1,5 and 2,2 mm. A setup with straight wires with 10 bends (5 loops) on one of the two cables. Bends should be of radius 12 mm. All bends should have the same diameter. Two POF active equipment of type media converter 100 Mbps/1 Gbps with connector less MDI interface. One POF active equipment of type media Ethernet switch 100 Mbps/1 Gbps with connector less MDI interfaces. One IP over Ethernet network host (HOST-S) to act as the heavy file source configured per clause 4.2.3 and connected to the POF Ethernet switch through the first POF media converter. One IP over Ethernet network host (HOST-C) to act as the heavy file destination configured per clause 4.2.3 and connected to the POF Ethernet switch through the second POF media converter.	
Expected behaviour	
Connecting the POF cable to the equipment MDI interfaces. When all POF active equipment will have their respective transmit (TX) and receive (RX) interfaces connected to each other, PHY and MAC Ethernet protocol layers should operate normally enabling IP communications between the involved network hosts. Verify IP network capability. Network Ping requests between HOST-S and HOST-C (and vice versa) should result in the reception of Ping answers, without any ICMP packet losses, associated with round trip time of 1 ms in average. Run the application scenario. Inserting 10 bends across the POF cable path should still permit application scenario to run smoothly and high network bandwidth usages (up to 0,85 Gbps) generated by the heavy file transfer to be realized.	
Final situation	
The link status of the media converters and the Ethernet Switch should all indicate correct sync state. The data rate speed operation status should be 1 Gbps on all equipment interfaces. The heavy file transfer should perform seamlessly and fluently without any interruption and informed network speed on HOST-S should remain stable along the complete data transfer.	

TP ID	TP/POF/AT/MEDIA/BV/12
Test objective	Operate a network traffic generator service between two IP hosts over POF 100 Mbps/1 Gbps infrastructure through fibre links with a length of 50 metres with 10 bends.
Initial situation	
Cutting the POF cable with a dedicated cutting tool. A POF cable segment of 50 metres with fibre diameter (including jacket) included between 1,5 and 2,2 mm. A setup with straight wires with 10 bends (5 loops) on one of the two cables. Bends should be of radius 12 mm. All bends should have the same diameter. Two POF active equipment of type media converter 100 Mbps/1 Gbps with connector less MDI interface. One POF active equipment of type media Ethernet switch 100 Mbps/1 Gbps with connector less MDI interfaces. One IP over Ethernet network host (HOST-S) to act as the network traffic generator configured per clause 4.2.4 and connected to the POF Ethernet switch through the first POF media converter. One IP over Ethernet network host (HOST-C) to act as the network simulated traffic consumer configured per clause 4.2.4 and connected to the POF Ethernet switch through the second POF media converter.	
Expected behaviour	
Connecting the POF cable to the equipment MDI interfaces. When all POF active equipment will have their respective transmit (TX) and receive (RX) interfaces connected to each other, PHY and MAC Ethernet protocol layers should operate normally enabling IP communications between the involved network hosts. Verify IP network capability. Network Ping requests between HOST-S and HOST-C (and vice versa) should result in the reception of Ping answers, without any ICMP packet losses, associated with round trip time of 1 ms in average. Run the application scenario. Inserting 5 bends across the POF cable path should still permit application scenario to run smoothly and high network bandwidth usages (up to 0,85 Gbps) produced by the network traffic generator to be operated.	
Final situation	
The link status of the media converters and the Ethernet Switch should all indicate correct sync state. The data rate speed operation status should be 1 Gbps on all equipment interfaces. The data network stream should perform seamlessly and fluently without any interruption and informed network speeds on HOST-S and HOST-C should remain stable along the complete traffic simulation.	

TP ID	TP/POF/AT/MEDIA/BV/13
Test objective	Operate a high-resolution video streaming service between two IP hosts over POF 100 Mbps/1 Gbps infrastructure through fibre links with a length of 100 metres with 5 bends.
Initial situation	
Cutting the POF cable with a dedicated cutting tool. A POF cable segment of 100 metres with fibre diameter (including jacket) included between 1,5 and 2,2 mm. A setup with straight wires with 5 bends (2,5 loops) on one of the two cables. Bends should be of radius 12 mm. All bends should have the same diameter. Two POF active equipment of type media converter 100 Mbps/1 Gbps with connector less MDI interface. One POF active equipment of type media Ethernet switch 100 Mbps/1 Gbps with connector less MDI interfaces. One IP over Ethernet network host (HOST-S) to act as the streaming source configured per clause 4.2.2 and connected to the POF Ethernet switch through the first POF media converter. One IP over Ethernet network host (HOST-C) to act as the stream consumer configured per clause 4.2.2 and connected to the POF Ethernet switch through the second POF media converter.	
Expected behaviour	
Connecting the POF cable to the equipment MDI interfaces. When all POF active equipment will have their respective transmit (TX) and receive (RX) interfaces connected to each other, PHY and MAC Ethernet protocol layers should operate normally enabling IP communications between the involved network hosts. Verify IP network capability. Network Ping requests between HOST-S and HOST-C (and vice versa) should result in the reception of Ping answers, without any ICMP packet losses, associated with round trip time of 1 ms in average. Run the application scenario. Inserting 5 bends across the POF cable path should still permit application scenario to run smoothly and high network bandwidth usages (up to 0,25 Gbps) produced by the HD/UHD video stream to be delivered.	
Final situation	
The link status of the media converters and the Ethernet Switch should all indicate correct sync state. The data rate speed operation status should be 1 Gbps on all equipment interfaces. The video stream should display on HOST-C seamlessly and fluently without any visual artefact (ex. Pixellation), providing therefore a good subjective audio visual quality.	

TP ID	TP/POF/AT/MEDIA/BV/14
Test objective	Operate a heavy file transfer service between two IP hosts over POF 100 Mbps/1 Gbps infrastructure through fibre links with a length of 100 metres with 5 bends.
Initial situation	
Cutting the POF cable with a dedicated cutting tool. A POF cable segment of 100 metres with fibre diameter (including jacket) included between 1,5 and 2,2 mm. A setup with straight wires with 5 bends (2,5 loops) on one of the two cables. Bends should be of radius 12 mm. All bends should have the same diameter. Two POF active equipment of type media converter 100 Mbps/1 Gbps with connector less MDI interface. One POF active equipment of type media Ethernet switch 100 Mbps/1 Gbps with connector less MDI interfaces. One IP over Ethernet network host (HOST-S) to act as the heavy file source configured per clause 4.2.3 and connected to the POF Ethernet switch through the first POF media converter. One IP over Ethernet network host (HOST-C) to act as the heavy file destination configured per clause 4.2.3 and connected to the POF Ethernet switch through the second POF media converter.	
Expected behaviour	
Connecting the POF cable to the equipment MDI interfaces. When all POF active equipment will have their respective transmit (TX) and receive (RX) interfaces connected to each other, PHY and MAC Ethernet protocol layers should operate normally enabling IP communications between the involved network hosts. Verify IP network capability. Network Ping requests between HOST-S and HOST-C (and vice versa) should result in the reception of Ping answers, without any ICMP packet losses, associated with round trip time of 1 ms in average. Run the application scenario. Inserting 5 bends across the POF cable path should still permit application scenario to run smoothly and high network bandwidth usages (up to 0,25 Gbps) generated by the heavy file transfer to be realized.	
Final situation	
The link status of the media converters and the Ethernet Switch should all indicate correct sync state. The data rate speed operation status should be 1 Gbps on all equipment interfaces. The heavy file transfer should perform seamlessly and fluently without any interruption and informed network speed on HOST-S should remain stable along the complete data transfer.	

TP ID	TP/POF/AT/MEDIA/BV/15
Test objective	Operate a network traffic generator service between two IP hosts over POF 100 Mbps/1 Gbps infrastructure through fibre links with a length of 100 metres with 5 bends.
Initial situation	
Cutting the POF cable with a dedicated cutting tool. A POF cable segment of 100 metres with fibre diameter (including jacket) included between 1,5 and 2,2 mm. A setup with straight wires with 5 bends (2,5 loops) on one of the two cables. Bends should be of radius 12 mm. All bends should have the same diameter. Two POF active equipment of type media converter 100 Mbps/1 Gbps with connector less MDI interface. One POF active equipment of type media Ethernet switch 100 Mbps/1 Gbps with connector less MDI interfaces. One IP over Ethernet network host (HOST-S) to act as the network traffic generator configured per clause 4.2.4 and connected to the POF Ethernet switch through the first POF media converter. One IP over Ethernet network host (HOST-C) to act as the network simulated traffic consumer configured per clause 4.2.4 and connected to the POF Ethernet switch through the second POF media converter.	
Expected behaviour	
Connecting the POF cable to the equipment MDI interfaces. When all POF active equipment will have their respective transmit (TX) and receive (RX) interfaces connected to each other, PHY and MAC Ethernet protocol layers should operate normally enabling IP communications between the involved network hosts. Verify IP network capability. Network Ping requests between HOST-S and HOST-C (and vice versa) should result in the reception of Ping answers, without any ICMP packet losses, associated with round trip time of 1 ms in average. Run the application scenario. Inserting 5 bends across the POF cable path should still permit application scenario to run smoothly and high network bandwidth usages (up to 0,25 Gbps) produced by the network traffic generator to be operated.	
Final situation	
The link status of the media converters and the Ethernet Switch should all indicate correct sync state. The data rate speed operation status should be 1 Gbps on all equipment interfaces. The data network stream should perform seamlessly and fluently without any interruption and informed network speeds on HOST-S and HOST-C should remain stable along the complete traffic simulation.	

TP ID	TP/POF/AT/MEDIA/BV/16
Test objective	Operate a high-resolution video streaming service between two IP hosts over POF 100 Mbps/1 Gbps infrastructure through fibre links with a length of 100 metres with 10 bends.
Initial situation	
Cutting the POF cable with a dedicated cutting tool. A POF cable segment of 100 metres with fibre diameter (including jacket) included between 1,5 and 2,2 mm. A setup with straight wires with 10 bends (5 loops) on one of the two cables. Bends should be of radius 12 mm. All bends should have the same diameter. Two POF active equipment of type media converter 100 Mbps/1 Gbps with connector less MDI interface. One POF active equipment of type media Ethernet switch 100 Mbps/1 Gbps with connector less MDI interfaces. One IP over Ethernet network host (HOST-S) to act as the streaming source configured per clause 4.2.2 and connected to the POF Ethernet switch through the first POF media converter. One IP over Ethernet network host (HOST-C) to act as the stream consumer configured per clause 4.2.2 and connected to the POF Ethernet switch through the second POF media converter.	
Expected behaviour	
Connecting the POF cable to the equipment MDI interfaces. When all POF active equipment will have their respective transmit (TX) and receive (RX) interfaces connected to each other, PHY and MAC Ethernet protocol layers should operate normally enabling IP communications between the involved network hosts. Verify IP network capability. Network Ping requests between HOST-S and HOST-C (and vice versa) should result in the reception of Ping answers, without any ICMP packet losses, associated with round trip time of 1 ms in average. Run the application scenario. Inserting 10 bends across the POF cable path should still permit application scenario to run but with a significant impact and low network bandwidth usages (up to 0,08 Gbps) produced by the HD/UHD video stream to be delivered.	
Final situation	
The link status of the media converters and the Ethernet Switch should all indicate correct sync state. The data rate speed operation status should be 1 Gbps on all equipment interfaces. The video stream should not display on HOST-C seamlessly and fluently and numerous visual artefact (pixellation) will occur, providing therefore a bad subjective audio visual quality.	

TP ID	TP/POF/AT/MEDIA/BV/17
Test objective	Operate a heavy file transfer service between two IP hosts over POF 100 Mbps/1 Gbps infrastructure through fibre links with a length of 100 metres with 10 bends.
Initial situation	
Cutting the POF cable with a dedicated cutting tool. A POF cable segment of 100 metres with fibre diameter (including jacket) included between 1,5 and 2,2 mm. A setup with straight wires with 10 bends (5 loops) on one of the two cables. Bends should be of radius 12 mm. All bends should have the same diameter. Two POF active equipment of type media converter 100 Mbps/1 Gbps with connector less MDI interface. One POF active equipment of type media Ethernet switch 100 Mbps/1 Gbps with connector less MDI interfaces. One IP over Ethernet network host (HOST-S) to act as the heavy file source configured per clause 4.2.3 and connected to the POF Ethernet switch through the first POF media converter. One IP over Ethernet network host (HOST-C) to act as the heavy file destination configured per clause 4.2.3 and connected to the POF Ethernet switch through the second POF media converter.	
Expected behaviour	
Connecting the POF cable to the equipment MDI interfaces. When all POF active equipment will have their respective transmit (TX) and receive (RX) interfaces connected to each other, PHY and MAC Ethernet protocol layers should operate normally enabling IP communications between the involved network hosts. Verify IP network capability. Network Ping requests between HOST-S and HOST-C (and vice versa) should result in the reception of Ping answers, without any ICMP packet losses, associated with round trip time of 1 ms in average. Run the application scenario. Inserting 10 bends across the POF cable path should still permit application scenario to run but with a significant impact and low network bandwidth usages (up to 0,08 Gbps) generated by the heavy file transfer to be realized.	
Final situation	
The link status of the media converters and the Ethernet Switch should all indicate correct sync state. The data rate speed operation status should be 1 Gbps on all equipment interfaces. The heavy file transfer should perform seamlessly and fluently without any interruption and informed network speed on HOST-S should remain stable along the complete data transfer.	

TP ID	TP/POF/AT/MEDIA/BV/18
Test objective	Operate a network traffic generator service between two IP hosts over POF 100 Mbps/1 Gbps infrastructure through fibre links with a length of 100 metres with 10 bends.
Initial situation	
Cutting the POF cable with a dedicated cutting tool. A POF cable segment of 100 metres with fibre diameter (including jacket) included between 1,5 and 2,2 mm. A setup with straight wires with 10 bends (5 loops) on one of the two cables. Bends should be of radius 12 mm. All bends should have the same diameter. Two POF active equipment of type media converter 100 Mbps/1 Gbps with connector less MDI interface. One POF active equipment of type media Ethernet switch 100 Mbps/1 Gbps with connector less MDI interfaces. One IP over Ethernet network host (HOST-S) to act as the network traffic generator configured per clause 4.2.4 and connected to the POF Ethernet switch through the first POF media converter. One IP over Ethernet network host (HOST-C) to act as the network simulated traffic consumer configured per clause 4.2.4 and connected to the POF Ethernet switch through the second POF media converter.	
Expected behaviour	
Connecting the POF cable to the equipment MDI interfaces. When all POF active equipment will have their respective transmit (TX) and receive (RX) interfaces connected to each other, PHY and MAC Ethernet protocol layers should operate normally enabling IP communications between the involved network hosts. Verify IP network capability. Network Ping requests between HOST-S and HOST-C (and vice versa) should result in the reception of Ping answers, without any ICMP packet losses, associated with round trip time of 1 ms in average. Run the application scenario. Inserting 10 bends across the POF cable path should still permit application scenario to run but with a significant impact and low network bandwidth usages (up to 0,08 Gbps) produced by the network traffic generator to be operated.	
Final situation	
The link status of the media converters and the Ethernet Switch should all indicate correct sync state. The data rate speed operation status should be 1 Gbps on all equipment interfaces. The data network stream should perform seamlessly and fluently without any interruption and informed network speeds on HOST-S and HOST-C should remain stable along the complete traffic simulation.	

=damage; no injury=

TP ID	TP/POF/AT/MEDIA/BV/19
Test objective	Operate a high-resolution video streaming service between two IP hosts over POF 100 Mbps/1 Gbps infrastructure through fibre links with a length of 10 metres without any bends when POF cable is damaged (chew, crush or torsion without an injury to the cable jacket).
Initial situation	
Cutting the POF cable with a dedicated cutting tool. A POF cable segment of 10 metres with fibre diameter (including jacket) included between 1,5 and 2,2 mm. A setup with straight wires without any bends. Two POF active equipment of type media converter 100 Mbps/1 Gbps with connector less MDI interface. One POF active equipment of type media Ethernet switch 100 Mbps/1 Gbps with connector less MDI interfaces. One IP over Ethernet network host (HOST-S) to act as the streaming source configured per clause 4.2.2 and connected to the POF Ethernet switch through the first POF media converter. One IP over Ethernet network host (HOST-C) to act as the stream consumer configured per clause 4.2.2 and connected to the POF Ethernet switch through the second POF media converter.	
Expected behaviour	
Setup the operation with a damage without an injury on the POF cable: firmly chew, crush or apply a strong torsion the cable anywhere without breaking the cable jacket (not making the fibre core visible). Connecting the POF cable to the equipment MDI interfaces. When all POF active equipment will have their respective transmit (TX) and receive (RX) interfaces connected to each other, PHY and MAC Ethernet protocol layers should operate normally enabling IP communications between the involved network hosts. Verify IP network capability. Network Ping requests between HOST-S and HOST-C (and vice versa) should result in the reception of Ping answers, without any ICMP packet losses, associated with round trip time of 1 ms in average. Run the application scenario. Selected application scenario should run smoothly and high network bandwidth usages (up to 1 Gbps) produced by the HD/UHD video stream should be delivered.	
Final situation	
The link status of the media converters and the Ethernet Switch should all indicate correct sync state. The data rate speed operation status should be 1 Gbps on all equipment interfaces. The video stream should display on HOST-C seamlessly and fluently without any visual artefact (pixellation), providing therefore a good subjective audio visual quality.	

TP ID	TP/POF/AT/MEDIA/BV/20
Test objective	Operate a heavy file transfer service between two IP hosts over POF 100 Mbps/1 Gbps infrastructure through fibre links with a length of 10 metres without any bends when POF cable is damaged (chew, crush or torsion without an injury to the cable jacket).
Initial situation	
Cutting the POF cable with a dedicated cutting tool. A POF cable segment of 10 metres with fibre diameter (including jacket) included between 1,5 and 2,2 mm. A setup with straight wires without any bends. Two POF active equipment of type media converter 100 Mbps/1 Gbps with connector less MDI interface. One POF active equipment of type media Ethernet switch 100 Mbps/1 Gbps with connector less MDI interfaces. One IP over Ethernet network host (HOST-S) to act as the heavy file source configured per clause 4.2.3 and connected to the POF Ethernet switch through the first POF media converter. One IP over Ethernet network host (HOST-C) to act as the heavy file destination configured per clause 4.2.3 and connected to the POF Ethernet switch through the second POF media converter.	
Expected behaviour	
Setup the operation with a damage without an injury on the POF cable: firmly chew, crush or apply a strong torsion the cable anywhere without breaking the cable jacket (not making the fibre core visible). Connecting the POF cable to the equipment MDI interfaces. When all POF active equipment will have their respective transmit (TX) and receive (RX) interfaces connected to each other, PHY and MAC Ethernet protocol layers should operate normally enabling IP communications between the involved network hosts. Verify IP network capability. Network Ping requests between HOST-S and HOST-C (and vice versa) should result in the reception of Ping answers, without any ICMP packet losses, associated with round trip time of 1 ms in average. Run the application scenario. Selected application scenario should run smoothly and high network bandwidth usages (up to 1 Gbps) should be reached by the heavy file transfer.	
Final situation	
The link status of the media converters and the Ethernet Switch should all indicate correct sync state. The data rate speed operation status should be 1 Gbps on all equipment interfaces. The heavy file transfer should perform seamlessly and fluently without any interruption and informed network speed on HOST-S should remain stable along the complete data transfer.	

TP ID	TP/POF/AT/MEDIA/BV/21
Test objective	Operate a network traffic generator service between two IP hosts over POF 100 Mbps/1 Gbps infrastructure through fibre links with a length of 10 metres without any bends when POF cable is damaged (chew, crush or torsion without an injury to the cable jacket).
Initial situation	
Cutting the POF cable with a dedicated cutting tool. A POF cable segment of 10 metres with fibre diameter (including jacket) included between 1,5 and 2,2 mm. A setup with straight wires without any bends. Two POF active equipment of type media converter 100 Mbps/1 Gbps with connector less MDI interface. One POF active equipment of type media Ethernet switch 100 Mbps/1 Gbps with connector less MDI interfaces. One IP over Ethernet network host (HOST-S) to act as the network traffic generator configured per clause 4.2.4 and connected to the POF Ethernet switch through the first POF media converter. One IP over Ethernet network host (HOST-C) to act as the network simulated traffic consumer configured per clause 4.2.4 and connected to the POF Ethernet switch through the second POF media converter.	
Expected behaviour	
Setup the operation with a damage without an injury on the POF cable: firmly chew, crush or apply a strong torsion the cable anywhere without breaking the cable jacket (not making the fibre core visible). Connecting the POF cable to the equipment MDI interfaces. When all POF active equipment will have their respective transmit (TX) and receive (RX) interfaces connected to each other, PHY and MAC Ethernet protocol layers should operate normally enabling IP communications between the involved network hosts. Verify IP network capability. Network Ping requests between HOST-S and HOST-C (and vice versa) should result in the reception of Ping answers, without any ICMP packet losses, associated with round trip time of 1 ms in average. Run the application scenario. The application scenario should run smoothly and high network bandwidth usages (up to 1 Gbps) produced by the network traffic generator should be operated.	
Final situation	
The link status of the media converters and the Ethernet Switch should all indicate correct sync state. The data rate speed operation status should be 1 Gbps on all equipment interfaces. The data network stream should perform seamlessly and fluently without any interruption and informed network speeds on HOST-S and HOST-C should remain stable along the complete traffic simulation.	

TP ID	TP/POF/AT/MEDIA/BV/22
Test objective	Operate a high-resolution video streaming service between two IP hosts over POF 100 Mbps/1 Gbps infrastructure through fibre links with a length of 50 metres without any bends when POF cable is damaged (chew, crush or torsion without an injury to the cable jacket).
Initial situation	
Cutting the POF cable with a dedicated cutting tool. A POF cable segment of 50 metres with fibre diameter (including jacket) included between 1,5 and 2,2 mm. A setup with straight wires without any bends. Two POF active equipment of type media converter 100 Mbps/1 Gbps with connector less MDI interface. One POF active equipment of type media Ethernet switch 100 Mbps/1 Gbps with connector less MDI interfaces. One IP over Ethernet network host (HOST-S) to act as the streaming source configured per clause 4.2.2 and connected to the POF Ethernet switch through the first POF media converter. One IP over Ethernet network host (HOST-C) to act as the stream consumer configured per clause 4.2.2 and connected to the POF Ethernet switch through the second POF media converter.	
Expected behaviour	
Setup the operation with a damage without an injury on the POF cable: firmly chew, crush or apply a strong torsion the cable anywhere without breaking the cable jacket (not making the fibre core visible). Connecting the POF cable to the equipment MDI interfaces. When all POF active equipment will have their respective transmit (TX) and receive (RX) interfaces connected to each other, PHY and MAC Ethernet protocol layers should operate normally enabling IP communications between the involved network hosts. Verify IP network capability. Network Ping requests between HOST-S and HOST-C (and vice versa) should result in the reception of Ping answers, without any ICMP packet losses, associated with round trip time of 1 ms in average. Run the application scenario. Selected application scenario should run smoothly and high network bandwidth usages (up to 1 Gbps) produced by the HD/UHD video stream should be delivered.	
Final situation	
The link status of the media converters and the Ethernet Switch should all indicate correct sync state. The data rate speed operation status should be 1 Gbps on all equipment interfaces. The video stream should display on HOST-C seamlessly and fluently without any visual artefact (pixellation), providing therefore a good subjective audio visual quality.	

TP ID	TP/POF/AT/MEDIA/BV/23
Test objective	Operate a heavy file transfer service between two IP hosts over POF 100 Mbps/1 Gbps infrastructure through fibre links with a length of 50 metres without any bends when POF cable is damaged (chew, crush or torsion without an injury to the cable jacket).
Initial situation	
Cutting the POF cable with a dedicated cutting tool. A POF cable segment of 50 metres with fibre diameter (including jacket) included between 1,5 and 2,2 mm. A setup with straight wires without any bends. Two POF active equipment of type media converter 100 Mbps/1 Gbps with connector less MDI interface. One POF active equipment of type media Ethernet switch 100 Mbps/1 Gbps with connector less MDI interfaces. One IP over Ethernet network host (HOST-S) to act as the heavy file source configured per clause 4.2.3 and connected to the POF Ethernet switch through the first POF media converter. One IP over Ethernet network host (HOST-C) to act as the heavy file destination configured per clause 4.2.3 and connected to the POF Ethernet switch through the second POF media converter.	
Expected behaviour	
Setup the operation with a damage without an injury on the POF cable: firmly chew, crush or apply a strong torsion the cable anywhere without breaking the cable jacket (not making the fibre core visible). Connecting the POF cable to the equipment MDI interfaces. When all POF active equipment will have their respective transmit (TX) and receive (RX) interfaces connected to each other, PHY and MAC Ethernet protocol layers should operate normally enabling IP communications between the involved network hosts. Verify IP network capability. Network Ping requests between HOST-S and HOST-C (and vice versa) should result in the reception of Ping answers, without any ICMP packet losses, associated with round trip time of 1 ms in average. Run the application scenario. Selected application scenario should run smoothly and high network bandwidth usages (up to 1 Gbps) should be reached by the heavy file transfer.	
Final situation	
The link status of the media converters and the Ethernet Switch should all indicate correct sync state. The data rate speed operation status should be 1 Gbps on all equipment interfaces. The heavy file transfer should perform seamlessly and fluently without any interruption and informed network speed on HOST-S should remain stable along the complete data transfer.	

TP ID	TP/POF/AT/MEDIA/BV/24
Test objective	Operate a network traffic generator service between two IP hosts over POF 100 Mbps/1 Gbps infrastructure through fibre links with a length of 50 metres without any bends when POF cable is damaged (chew, crush or torsion without an injury to the cable jacket).
Initial situation	
Cutting the POF cable with a dedicated cutting tool. A POF cable segment of 50 metres with fibre diameter (including jacket) included between 1,5 and 2,2 mm. A setup with straight wires without any bends. Two POF active equipment of type media converter 100 Mbps/1 Gbps with connector less MDI interface. One POF active equipment of type media Ethernet switch 100 Mbps/1 Gbps with connector less MDI interfaces. One IP over Ethernet network host (HOST-S) to act as the network traffic generator configured per clause 4.2.4 and connected to the POF Ethernet switch through the first POF media converter. One IP over Ethernet network host (HOST-C) to act as the network simulated traffic consumer configured per clause 4.2.4 and connected to the POF Ethernet switch through the second POF media converter.	
Expected behaviour	
Setup the operation with a damage without an injury on the POF cable: firmly chew, crush or apply a strong torsion the cable anywhere without breaking the cable jacket (not making the fibre core visible). Connecting the POF cable to the equipment MDI interfaces. When all POF active equipment will have their respective transmit (TX) and receive (RX) interfaces connected to each other, PHY and MAC Ethernet protocol layers should operate normally enabling IP communications between the involved network hosts. Verify IP network capability. Network Ping requests between HOST-S and HOST-C (and vice versa) should result in the reception of Ping answers, without any ICMP packet losses, associated with round trip time of 1 ms in average. Run the application scenario. The application scenario should run smoothly and high network bandwidth usages (up to 1 Gbps) produced by the network traffic generator should be operated.	
Final situation	
The link status of the media converters and the Ethernet Switch should all indicate correct sync state. The data rate speed operation status should be 1 Gbps on all equipment interfaces. The data network stream should perform seamlessly and fluently without any interruption and informed network speeds on HOST-S and HOST-C should remain stable along the complete traffic simulation.	

TP ID	TP/POF/AT/MEDIA/BV/25
Test objective	Operate a high-resolution video streaming service between two IP hosts over POF 100 Mbps/1 Gbps infrastructure through fibre links with a length of 100 metres without any bends when POF cable is damaged (chew, crush or torsion without an injury to the cable jacket).
Initial situation	
Cutting the POF cable with a dedicated cutting tool. A POF cable segment of 100 metres with fibre diameter (including jacket) included between 1,5 and 2,2 mm. A setup with straight wires without any bends. Two POF active equipment of type media converter 100 Mbps/1 Gbps with connector less MDI interface. One POF active equipment of type media Ethernet switch 100 Mbps/1 Gbps with connector less MDI interfaces. One IP over Ethernet network host (HOST-S) to act as the streaming source configured per clause 4.2.2 and connected to the POF Ethernet switch through the first POF media converter. One IP over Ethernet network host (HOST-C) to act as the stream consumer configured per clause 4.2.2 and connected to the POF Ethernet switch through the second POF media converter.	
Expected behaviour	
Setup the operation with a damage without an injury on the POF cable: firmly chew, crush or apply a strong torsion the cable anywhere without breaking the cable jacket (not making the fibre core visible). Connecting the POF cable to the equipment MDI interfaces. When all POF active equipment will have their respective transmit (TX) and receive (RX) interfaces connected to each other, PHY and MAC Ethernet protocol layers should operate normally enabling IP communications between the involved network hosts. Verify IP network capability. Network Ping requests between HOST-S and HOST-C (and vice versa) should result in the reception of Ping answers, without any ICMP packet losses, associated with round trip time of 1 ms in average. Run the application scenario. Selected application scenario should run smoothly and high network bandwidth usages (up to 0,5 Gbps) produced by the HD/UHD video stream should be delivered.	
Final situation	
The link status of the media converters and the Ethernet Switch should all indicate correct sync state. The data rate speed operation status should be 1 Gbps on all equipment interfaces. The video stream should display on HOST-C seamlessly and fluently without any visual artefact (ex. Pixilation), providing therefore a good subjective audio visual quality.	

TP ID	TP/POF/AT/MEDIA/BV/26
Test objective	Operate a heavy file transfer service between two IP hosts over POF 100 Mbps/1 Gbps infrastructure through fibre links with a length of 100 metres without any bends when POF cable is damaged (chew, crush or torsion without an injury to the cable jacket).
Initial situation	
Cutting the POF cable with a dedicated cutting tool. A POF cable segment of 100 metres with fibre diameter (including jacket) included between 1,5 and 2,2 mm. A setup with straight wires without any bends. Two POF active equipment of type media converter 100 Mbps/1 Gbps with connector less MDI interface. One POF active equipment of type media Ethernet switch 100 Mbps/1 Gbps with connector less MDI interfaces. One IP over Ethernet network host (HOST-S) to act as the heavy file source configured per clause 4.2.3 and connected to the POF Ethernet switch through the first POF media converter. One IP over Ethernet network host (HOST-C) to act as the heavy file destination configured per clause 4.2.3 and connected to the POF Ethernet switch through the second POF media converter.	
Expected behaviour	
Setup the operation with a damage without an injury on the POF cable: firmly chew, crush or apply a strong torsion the cable anywhere without breaking the cable jacket (not making the fibre core visible). Connecting the POF cable to the equipment MDI interfaces. When all POF active equipment will have their respective transmit (TX) and receive (RX) interfaces connected to each other, PHY and MAC Ethernet protocol layers should operate normally enabling IP communications between the involved network hosts. Verify IP network capability. Network Ping requests between HOST-S and HOST-C (and vice versa) should result in the reception of Ping answers, without any ICMP packet losses, associated with round trip time of 1 ms in average. Run the application scenario. Selected application scenario should run smoothly and high network bandwidth usages (up to 0,5 Gbps) should be reached by the heavy file transfer.	
Final situation	
The link status of the media converters and the Ethernet Switch should all indicate correct sync state. The data rate speed operation status should be 1 Gbps on all equipment interfaces. The heavy file transfer should perform seamlessly and fluently without any interruption and informed network speed on HOST-S should remain stable along the complete data transfer.	

TP ID	TP/POF/AT/MEDIA/BV/27
Test objective	Operate a network traffic generator service between two IP hosts over POF 100 Mbps/1 Gbps infrastructure through fibre links with a length of 100 metres without any bends when POF cable is damaged (chew, crush or torsion without an injury to the cable jacket).
Initial situation	
Cutting the POF cable with a dedicated cutting tool. A POF cable segment of 100 metres with fibre diameter (including jacket) included between 1,5 and 2,2 mm. A setup with straight wires without any bends. Two POF active equipment of type media converter 100 Mbps/1 Gbps with connector less MDI interface. One POF active equipment of type media Ethernet switch 100 Mbps/1 Gbps with connector less MDI interfaces. One IP over Ethernet network host (HOST-S) to act as the network traffic generator configured per clause 4.2.4 and connected to the POF Ethernet switch through the first POF media converter. One IP over Ethernet network host (HOST-C) to act as the network simulated traffic consumer configured per clause 4.2.4 and connected to the POF Ethernet switch through the second POF media converter.	
Expected behaviour	
Setup the operation with a damage without an injury on the POF cable: firmly chew, crush or apply a strong torsion the cable anywhere without breaking the cable jacket (not making the fibre core visible). Connecting the POF cable to the equipment MDI interfaces. When all POF active equipment will have their respective transmit (TX) and receive (RX) interfaces connected to each other, PHY and MAC Ethernet protocol layers should operate normally enabling IP communications between the involved network hosts. Verify IP network capability. Network Ping requests between HOST-S and HOST-C (and vice versa) should result in the reception of Ping answers, without any ICMP packet losses, associated with round trip time of 1 ms in average. Run the application scenario. The application scenario should run smoothly and high network bandwidth usages (up to 0,5 Gbps) produced by the network traffic generator should be operated.	
Final situation	
The link status of the media converters and the Ethernet Switch should all indicate correct sync state. The data rate speed operation status should be 1 Gbps on all equipment interfaces. The data network stream should perform seamlessly and fluently without any interruption and informed network speeds on HOST-S and HOST-C should remain stable along the complete traffic simulation.	

=short link outage=

TP ID	TP/POF/AT/MEDIA/BV/28
Test objective	Operate a high-resolution video streaming service between two IP hosts over POF 100 Mbps/1 Gbps infrastructure with a length of 100 metres without any bends and introduce a link loss/recovery on the connectivity.
Initial situation	
Cutting the POF cable with a dedicated cutting tool. A POF cable segment of 10 metres with fibre diameter (including jacket) included between 1,5 and 2,2 mm. A setup with straight wires without any bends. Two POF active equipment of type media converter 100 Mbps/1 Gbps with connector less MDI interface. One POF active equipment of type media Ethernet switch 100 Mbps/1 Gbps with connector less MDI interfaces. One IP over Ethernet network host (HOST-S) to act as the streaming source configured per clause 4.2.2 and connected to the POF Ethernet switch through the first POF media converter. One IP over Ethernet network host (HOST-C) to act as the stream consumer configured per clause 4.2.2 and connected to the POF Ethernet switch through the second POF media converter.	
Expected behaviour	
Connecting the POF cables to the equipment. When all POF active equipment will have their respective transmit (TX) and receive (RX) interfaces connected to each other, PHY and MAC Ethernet protocol layers should operate normally enabling IP communications between the involved network hosts. Verify IP network capability. Before and after the link outage, Network Ping requests between HOST-S and HOST-C (and vice versa) should result in the reception of Ping answers, without any ICMP packet losses, associated with round trip time of 1 ms in average. Whereas during the link outage, Network Ping requests between HOST-S and HOST-C (and vice versa) should result in the loss of Ping answers, with 100 % ICMP packet losses. Run the application scenario. Introduce a link outage and then recover the link. The link outage can be realized in whichever POF interfaces, of the involved equipment, by disconnecting the POF cable from the selected MDI interface. Introducing a short link outage across whichever POF cable path should still permit application scenario, with data buffering capability, to run smoothly and high network bandwidth usages (up to 1 Gbps) produced by the HD/UHD video stream to be delivered. However, for live audiovisual stream where not data buffering capability is available, the application scenario will be impacted during the link outage and the HD/UHD video stream could not be delivered.	
Final situation	
Before and after the link outage, the link status of the media converters and the Ethernet Switch should all indicate correct sync state. The data rate speed operation status should be 1 Gbps on all equipment interfaces. Whereas during the link outage, the link status of the media converters and the Ethernet Switch should both indicate incorrect sync state for the link associated with the outage whereas the others should remain in correct sync state. The data rate speed operation status should be undefined on both equipment interfaces for the link associated with the outage whereas the others should be 1 Gbps. When data buffering capability is available, the video stream should display on HOST-C seamlessly and fluently without any visual artefact (pixilation), providing therefore a good subjective audio visual quality. However, for live audiovisual stream where not data buffering capability is available, the video stream should not display anymore on HOST-C, breaking therefore the service for the duration of the outage.	

TP ID	TP/POF/AT/MEDIA/BV/29
Test objective	Operate a heavy file transfer service between two IP hosts over POF 100 Mbps/1 Gbps infrastructure with a length of 100 metres without any bends and introduce a link loss/recovery on the connectivity.
Initial situation	
Cutting the POF cable with a dedicated cutting tool. A POF cable segment of 10 metres with fibre diameter (including jacket) included between 1,5 and 2,2 mm. A setup with straight wires without any bends. Two POF active equipment of type media converter 100 Mbps/1 Gbps with connector less MDI interface. One POF active equipment of type media Ethernet switch 100 Mbps/1 Gbps with connector less MDI interfaces. One IP over Ethernet network host (HOST-S) to act as the heavy file source configured per clause 4.2.3 and connected to the POF Ethernet switch through the first POF media converter. One IP over Ethernet network host (HOST-C) to act as the heavy file destination configured per clause 4.2.3 and connected to the POF Ethernet switch through the second POF media converter.	
Expected behaviour	
Connecting the POF cables to the equipment. When all POF active equipment will have their respective transmit (TX) and receive (RX) interfaces connected to each other, PHY and MAC Ethernet protocol layers should operate normally enabling IP communications between the involved network hosts. Verify IP network capability. Before and after the link outage, Network Ping requests between HOST-S and HOST-C (and vice versa) should result in the reception of Ping answers, without any ICMP packet losses, associated with round trip time of 1 ms in average. Whereas during the link outage, Network Ping requests between HOST-S and HOST-C (and vice versa) should result in the loss of Ping answers, with 100 % ICMP packet losses. Run the application scenario. Introduce a link outage and then recover the link. The link outage can be realized in whichever POF interfaces, of the involved equipment, by disconnecting the POF cable from the selected MDI interface. Introducing a short link outage across whichever POF cable path should still permit application scenario to run smoothly and high network bandwidth usages (up to 1 Gbps) generated by the heavy file transfer to be recovered after the link outage.	
Final situation	
Before and after the link outage, the link status of the media converters and the Ethernet Switch should all indicate correct sync state. The data rate speed operation status should be 1 Gbps on all equipment interfaces. Whereas during the link outage, the link status of the media converters and the Ethernet Switch should both indicate incorrect sync state for the link associated with the outage whereas the others should remain in correct sync state. The data rate speed operation status should be undefined on both equipment interfaces for the link associated with the outage whereas the others should be 1 Gbps. The heavy file transfer should perform seamlessly and fluently without any interruption and informed network speed on HOST-S should be briefly impacted while remaining stable along the overall data transfer.	

TP ID	TP/POF/AT/MEDIA/BV/30
Test objective	Operate a network traffic generator service between two IP hosts over POF 100 Mbps/1 Gbps infrastructure with a length of 100 metres without any bends and introduce a link loss/recovery on the connectivity.
Initial situation	
Cutting the POF cable with a dedicated cutting tool. A POF cable segment of 10 metres with fibre diameter (including jacket) included between 1,5 and 2,2 mm. A setup with straight wires without any bends. Two POF active equipment of type media converter 100 Mbps/1 Gbps with connector less MDI interface. One POF active equipment of type media Ethernet switch 100 Mbps/1 Gbps with connector less MDI interfaces. One IP over Ethernet network host (HOST-S) to act as the network traffic generator configured per clause 4.2.4 and connected to the POF Ethernet switch through the first POF media converter. One IP over Ethernet network host (HOST-C) to act as the network simulated traffic consumer configured per clause 4.2.4 and connected to the POF Ethernet switch through the second POF media converter.	
Expected behaviour	
Connecting the POF cables to the equipment. When all POF active equipment will have their respective transmit (TX) and receive (RX) interfaces connected to each other, PHY and MAC Ethernet protocol layers should operate normally enabling IP communications between the involved network hosts. Verify IP network capability. Before and after the link outage, Network Ping requests between HOST-S and HOST-C (and vice versa) should result in the reception of Ping answers, without any ICMP packet losses, associated with round trip time of 1 ms in average. Whereas during the link outage, Network Ping requests between HOST-S and HOST-C (and vice versa) should result in the loss of Ping answers, with some ICMP packet losses. Run the application scenario. Introduce a link outage and then recover the link. The link outage can be realized in whichever POF interfaces, of the involved equipment, by disconnecting the POF cable from the selected MDI interface. Introducing a short link outage across whichever POF cable path should still permit application scenario to run smoothly and high network bandwidth usages (up to 1 Gbps) produced by the network traffic generator to be operated and recovered after the link outage.	
Final situation	
Before and after the link outage, the link status of the media converters and the Ethernet Switch should all indicate correct sync state. The data rate speed operation status should be 1 Gbps on all equipment interfaces. Whereas during the link outage, the link status of the media converters and the Ethernet Switch should both indicate incorrect sync state for the link associated with the outage whereas the others should remain in correct sync state. The data rate speed operation status should be undefined on both equipment interfaces for the link associated with the outage whereas the others should be 1 Gbps. The data network stream should perform seamlessly and fluently without any interruption and informed network speeds on HOST-S and HOST-C should be briefly impacted while remaining stable along the overall traffic simulation. During the link outage, dynamic traffic analysis on HOST-S and HOST-C will report the network speeds drop.	

4.5.3.3 ACTIVE - TP/POF/AT/MEDIA/BI

=bending=

TP ID	TP/POF/AT/MEDIA/BI/01
Test objective	Operate a high-resolution video streaming service between two IP hosts over POF 100 Mbps/1 Gbps infrastructure through fibre links with a length of 50 metres with 30 bends.
Initial situation	
Cutting the POF cable with a dedicated cutting tool. A POF cable segment of 50 metres with fibre diameter (including jacket) included between 1,5 and 2,2 mm. A setup with straight wires with 30 bends on one of the two cables. Bends should be of radius 12 mm. All bends should have the same diameter. Two POF active equipment of type media converter 100 Mbps/1 Gbps with connector less MDI interface. One POF active equipment of type media Ethernet switch 100 Mbps/1 Gbps with connector less MDI interfaces. One IP over Ethernet network host (HOST-S) to act as the streaming source configured per clause 4.2.2 and connected to the POF Ethernet switch through the first POF media converter. One IP over Ethernet network host (HOST-C) to act as the stream consumer configured per clause 4.2.2 and connected to the POF Ethernet switch through the second POF media converter.	
Expected behaviour	
Connecting the POF cable to the equipment MDI interfaces. When all POF active equipment will have their respective transmit (TX) and receive (RX) interfaces connected to each other, PHY and MAC Ethernet protocol layers should not operate normally disabling IP communications between the involved network hosts. Verify IP network capability. Network Ping requests between HOST-S and HOST-C (and vice versa) should result in the loss of Ping answers, with 100 % ICMP packet losses. Run the application scenario. Inserting 30 bends across the POF cable path should not permit application scenario to run.	
Final situation	
The link status of the media converters should both indicate incorrect sync state. The data rate speed operation status should be undefined on both equipment interfaces.	

TP ID	TP/POF/AT/MEDIA/BI/02
Test objective	Operate a heavy file transfer service between two IP hosts over POF 100 Mbps/1 Gbps infrastructure through fibre links with a length of 50 metres with 30 bends.
Initial situation	
Cutting the POF cable with a dedicated cutting tool. A POF cable segment of 50 metres with fibre diameter (including jacket) included between 1,5 and 2,2 mm. A setup with straight wires with 30 bends on one of the two cables. Bends should be of radius 12 mm. All bends should have the same diameter. Two POF active equipment of type media converter 100 Mbps/1 Gbps with connector less MDI interface. One POF active equipment of type media Ethernet switch 100 Mbps/1 Gbps with connector less MDI interfaces. One IP over Ethernet network host (HOST-S) to act as the heavy file source configured per clause 4.2.3 and connected to the POF Ethernet switch through the first POF media converter. One IP over Ethernet network host (HOST-C) to act as the heavy file destination configured per clause 4.2.3 and connected to the POF Ethernet switch through the second POF media converter.	
Expected behaviour	
Connecting the POF cable to the equipment MDI interfaces. When all POF active equipment will have their respective transmit (TX) and receive (RX) interfaces connected to each other, PHY and MAC Ethernet protocol layers should not operate normally disabling IP communications between the involved network hosts. Verify IP network capability. Network Ping requests between HOST-S and HOST-C (and vice versa) should result in the loss of Ping answers, with 100 % ICMP packet losses. Run the application scenario. Inserting 30 bends across the POF cable path should not permit application scenario to run.	
Final situation	
The link status of the media converters should both indicate incorrect sync state. The data rate speed operation status should be undefined on both equipment interfaces.	

TP ID	TP/POF/AT/MEDIA/BI/03
Test objective	Operate a network traffic generator service between two IP hosts over POF 100 Mbps/1 Gbps infrastructure through fibre links with a length of 50 metres with 30 bends.
Initial situation	
Cutting the POF cable with a dedicated cutting tool. A POF cable segment of 50 metres with fibre diameter (including jacket) included between 1,5 and 2,2 mm. A setup with straight wires with 30 bends on one of the two cables. Bends should be of radius 12 mm. All bends should have the same diameter. Two POF active equipment of type media converter 100 Mbps/1 Gbps with connector less MDI interface. One POF active equipment of type media Ethernet switch 100 Mbps/1 Gbps with connector less MDI interfaces. One IP over Ethernet network host (HOST-S) to act as the heavy file source configured per clause 4.2.3 and connected to the POF Ethernet switch through the first POF media converter. One IP over Ethernet network host (HOST-C) to act as the heavy file destination configured per clause 4.2.3 and connected to the POF Ethernet switch through the second POF media converter.	
Expected behaviour	
Connecting the POF cable to the equipment MDI interfaces. When all POF active equipment will have their respective transmit (TX) and receive (RX) interfaces connected to each other, PHY and MAC Ethernet protocol layers should not operate normally disabling IP communications between the involved network hosts. Verify IP network capability. Network Ping requests between HOST-S and HOST-C (and vice versa) should result in the loss of Ping answers, with 100 % ICMP packet losses. Run the application scenario. Inserting 30 bends across the POF cable path should not permit application scenario to run.	
Final situation	
The link status of the media converters should both indicate incorrect sync state. The data rate speed operation status should be undefined on both equipment interfaces.	

=damage; injury=

P ID	TP/POF/AT/MEDIA/BI/04
Test objective	Operate a high-resolution video streaming service between two IP hosts over POF 100 Mbps/1 Gbps infrastructure through fibre links with a length of 50 metres without any bends when POF cable is damaged (chew, crush or torsion with an injury on the cable jacket).
Initial situation	
Cutting the POF cable with a dedicated cutting tool. A POF cable segment of 50 metres with fibre diameter (including jacket) included between 1,5 and 2,2 mm. A setup with a straight wire without any bends. Two POF active equipment of type media converter 100 Mbps/1 Gbps with connector less MDI interface. One POF active equipment of type media Ethernet switch 100 Mbps/1 Gbps with connector less MDI interfaces. One IP over Ethernet network host (HOST-S) to act as the streaming source configured per clause 4.2.2 and connected to the POF Ethernet switch through the first POF media converter. One IP over Ethernet network host (HOST-C) to act as the stream consumer configured per clause 4.2.2 and connected to the POF Ethernet switch through the second POF media converter.	
Expected behaviour	
Connecting the POF cable to the equipment MDI interfaces. When all POF active equipment will have their respective transmit (TX) and receive (RX) interfaces connected to each other, PHY and MAC Ethernet protocol layers should operate normally enabling IP communications between the involved network hosts. Verify IP network capability. Before the injury, Network Ping requests between HOST-S and HOST-C (and vice versa) should result in the reception of Ping answers, without any ICMP packet losses, associated with round trip time of 1 ms in average. Whereas after the injury, Network Ping requests between HOST-S and HOST-C (and vice versa) should result in the loss of Ping answers, with 100 % ICMP packet losses. Run the application scenario. Introduce an injury on the POF cable: firmly chew, crush or apply a strong torsion the cable anywhere and scrap the cable jacket (making the fibre core visible). The cable injury can be realized in whichever POF cable path, of the involved equipment. Damaging the POF cable path with an injury on the cable jacket should not permit anymore application scenario to run and the HD/UHD video stream could not be delivered. Some light exits at the damage location as fibre core is visible.	
Final situation	
The link status of the media converters and the Ethernet Switch should both indicate incorrect sync state for the link associated with the injury whereas the others should remain in correct sync state. The data rate speed operation status should be undefined on both equipment interfaces for the link associated with the injury whereas the others should be 1 Gbps. The video stream should stop displaying on HOST-C, breaking therefore the service.	

TP ID	TP/POF/AT/MEDIA/BI/05
Test objective	Operate a heavy file transfer service between two IP hosts over POF 100 Mbps/1 Gbps infrastructure through fibre links with a length of 50 metres without any bends when POF cable is damaged (chew, crush or torsion with an injury on the cable jacket).
Initial situation	
Cutting the POF cable with a dedicated cutting tool. A POF cable segment of 50 metres with fibre diameter (including jacket) included between 1,5 and 2,2 mm. A setup with a straight wire without any bends. Two POF active equipment of type media converter 100 Mbps/1 Gbps with connector less MDI interface. One POF active equipment of type media Ethernet switch 100 Mbps/1 Gbps with connector less MDI interfaces. One IP over Ethernet network host (HOST-S) to act as the heavy file source configured per clause 4.2.3 and connected to the POF Ethernet switch through the first POF media converter. One IP over Ethernet network host (HOST-C) to act as the heavy file destination configured per clause 4.2.3 and connected to the POF Ethernet switch through the second POF media converter.	
Expected behaviour	
Connecting the POF cable to the equipment MDI interfaces. When all POF active equipment will have their respective transmit (TX) and receive (RX) interfaces connected to each other, PHY and MAC Ethernet protocol layers should operate normally enabling IP communications between the involved network hosts. Verify IP network capability. Before the injury, Network Ping requests between HOST-S and HOST-C (and vice versa) should result in the reception of Ping answers, without any ICMP packet losses, associated with round trip time of 1 ms in average. Whereas after the injury, Network Ping requests between HOST-S and HOST-C (and vice versa) should result in the loss of Ping answers, with 100 % ICMP packet losses. Run the application scenario. Introduce an injury on the POF cable: firmly chew, crush or apply a strong torsion the cable anywhere and scrap the cable jacket (making the fibre core visible). The cable injury can be realized in whichever POF cable path, of the involved equipment. Damaging the POF cable path with an injury on the cable jacket should not permit anymore application scenario to run and the heavy file transfer could not be completed. Some light exits at the damage location as fibre core is visible.	
Final situation	
The link status of the media converters and the Ethernet Switch should both indicate incorrect sync state for the link associated with the injury whereas the others should remain in correct sync state. The data rate speed operation status should be undefined on both equipment interfaces for the link associated with the injury whereas the others should be 1 Gbps. The heavy file transfer should interrupt and informed network speed on HOST-S should drop to zero delaying or aborting therefore the complete data transfer.	

TP ID	TP/POF/AT/MEDIA/BI/06
Test objective	Operate a network traffic generator service between two IP hosts over POF 100 Mbps/1 Gbps infrastructure through fibre links with a length of 50 metres without any bends when POF cable is damaged (chew, crush or torsion with an injury on the cable jacket).
Initial situation	
Cutting the POF cable with a dedicated cutting tool. A POF cable segment of 50 metres with fibre diameter (including jacket) included between 1,5 and 2,2 mm. A setup with a straight wire without any bends. Two POF active equipment of type media converter 100 Mbps/1 Gbps with connector less MDI interface. One POF active equipment of type media Ethernet switch 100 Mbps/1 Gbps with connector less MDI interfaces. One IP over Ethernet network host (HOST-S) to act as the network traffic generator configured per clause 4.2.4 and connected to the POF Ethernet switch through the first POF media converter. One IP over Ethernet network host (HOST-C) to act as the network simulated traffic consumer configured per clause 4.2.4 and connected to the POF Ethernet switch through the second POF media converter.	
Expected behaviour	
Connecting the POF cable to the equipment MDI interfaces. When all POF active equipment will have their respective transmit (TX) and receive (RX) interfaces connected to each other, PHY and MAC Ethernet protocol layers should operate normally enabling IP communications between the involved network hosts. Verify IP network capability. Before the injury, Network Ping requests between HOST-S and HOST-C (and vice versa) should result in the reception of Ping answers, without any ICMP packet losses, associated with round trip time of 1 ms in average. Whereas after the injury, Network Ping requests between HOST-S and HOST-C (and vice versa) should result in the loss of Ping answers, with 100 % ICMP packet losses. Run the application scenario. Introduce an injury on the POF cable: firmly chew, crush or apply a strong torsion the cable anywhere and scrap the cable jacket (making the fibre core visible). The cable injury can be realized in whichever POF cable path, of the involved equipment. Damaging the POF cable path with an injury on the cable jacket should not permit anymore application scenario to run and the network traffic generator could not stress the network anymore with the traffic simulation. Some light exits at the damage location as fibre core is visible.	
Final situation	
The link status of the media converters and the Ethernet Switch should both indicate incorrect sync state for the link associated with the injury whereas the others should remain in correct sync state. The data rate speed operation status should be undefined on both equipment interfaces for the link associated with the injury whereas the others should be 1 Gbps. The data network stream should interrupt and dynamic traffic analysis on HOST-S and HOST-C should not indicate traffic flow anymore.	

History

Document history		
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