



Automotive Application of Plastic Optical Fiber

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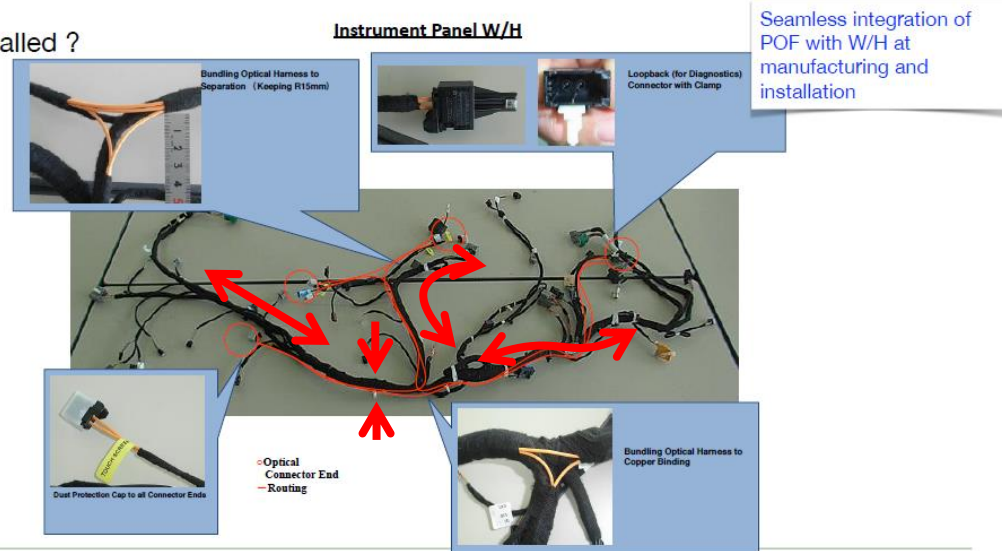
Innovation for Customers

Introduction – Optical System in the Car

- A significant increase of data transmission in cars, such as music, video, navigation system, and phone, requires high data rate network in the car.
- Optical system was promising solution to meet EMC compliance.
- MOST25 with optical transmission first introduced by BMW in 2001.
POF has 20 years of proven track record as optical transmission media for automotive. (https://www.ieee802.org/3/OMEGA/public/jan_2020/watanabe_OMEGA_01_0120.pdf)
- And, the car with 1000BASE-RH will be in the market.

Automotive Optical Ethernet Harness

- How is installed ?



IEEE 802.3 CFI July 2019: Automotive Optical Multi-Gig PHY

Carlos Pardo

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- Optical harness used in the car is affected by, such as side pressure, tension, bending, torsion, during cable routing and/or under assembled situation.
- GI-POF with flexibility and low bending loss is very suitable for this application.

https://www.ieee802.org/3/cfi/0719_1/CFI_01_0719.pdf

Impressions on Car Manufacturing



- Furthermore, the harness is handled roughly during installation due to its complex structure and space saving routing position.
- Electric and Optical Harness will be handled roughly at the car dealer and/or workshops.
- Therefore, POF is good candidate for this application due to its robustness.

14. April 2020

IEEE 802.3 Multi-Gigabit Automotive Optical PHYS (OMEGA) Study Group - teleconference

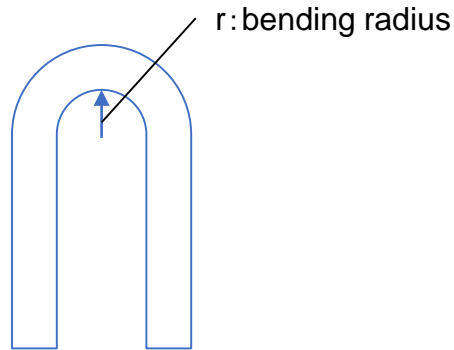
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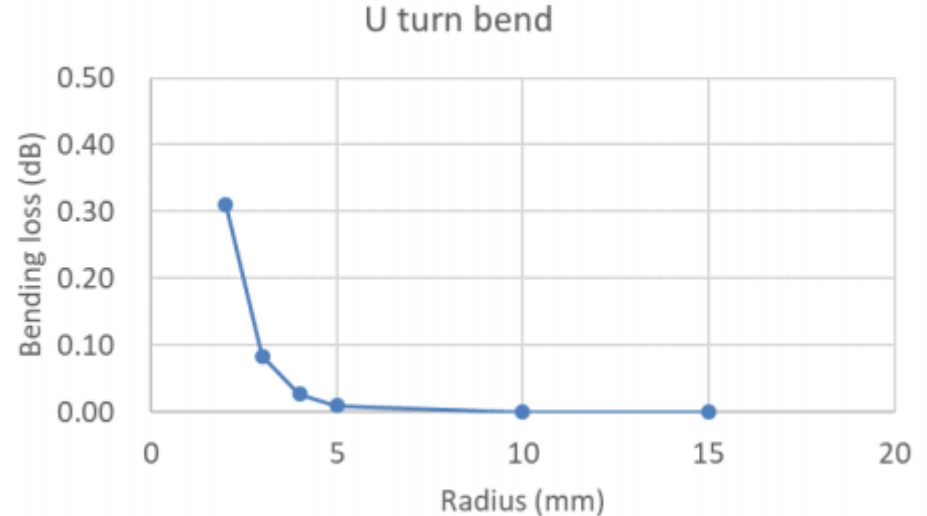
Effect of Bending

2-point bend test (U-shape)

Apply bending stress by 180 degrees turn



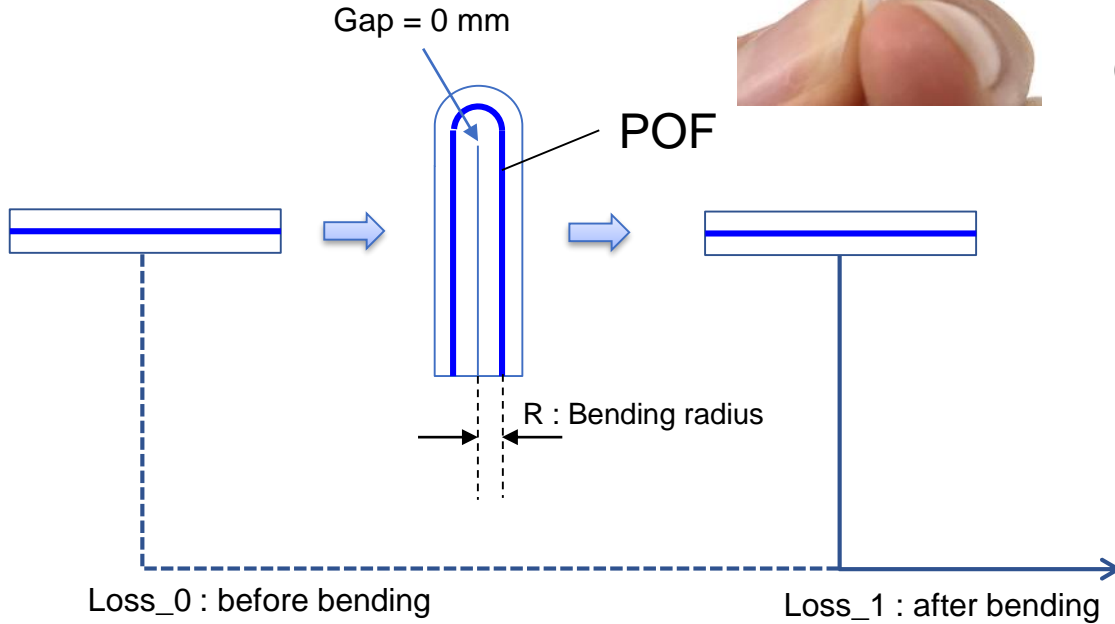
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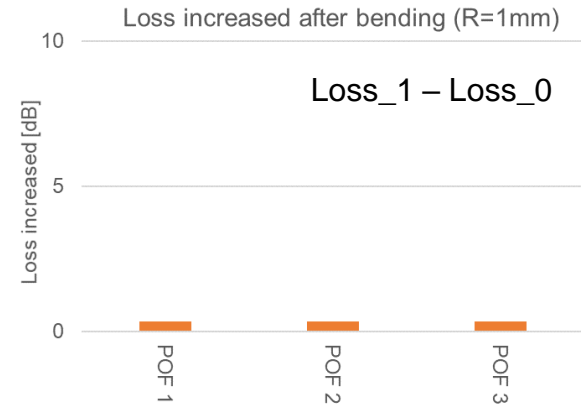
https://www.ieee802.org/3/cz/public/9_feb_2021/watanabe_3cz_01_090221_gipof.pdf

POF shows good bending tolerance.
This characteristic is favorable for assembly
and installation scene. (OEM-friendly)

Effect of Bending



Cable diameter is 2mm.
Loss increased after bending with
0 mm gap is very small.



- Optical fiber installation in the car has been achieved by POF. And it has proven track record for 20 years.
- Electric and Optical Harness will be handled roughly at the car dealer and/or workshops. It needs to consider the actual maintenance scene.
- Wider options, such as glass AND plastic, of link medium are preferable for the OEM and Tier 1.
- Transmitter wavelength should be set first before the discussion of link medium.

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