

OPTICAL COMMUNICATION IN COMPOSITES

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COMPOSITES WITH INTEGRATED OPTICAL FIBERS

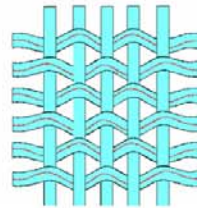
Composite armor offers the opportunity to embed communication cabling in the hull. Embedding of communication cabling and connectors in hull requires small sized components for armor integrity. Fiber optical systems offer the smallest possible dimensions.

The Objective is to integrate optical communication network in composites.

COMPOSITES WITH INTEGRATED OPTICAL FIBERS

2-D woven textile preforms are used in many applications. Optical fibers can be integrated into 2-D woven fabrics via an industrially proven 2-D weaving process. Tests showed no losses .

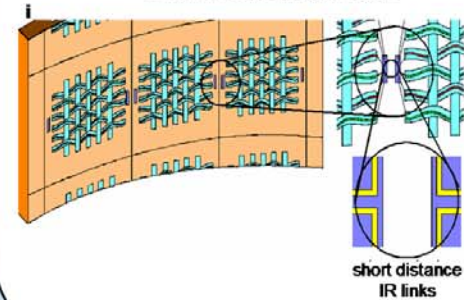
Optical fibers woven in composite



OPTICAL/ INFRARED COMMUNICATION IN COMPOSITE

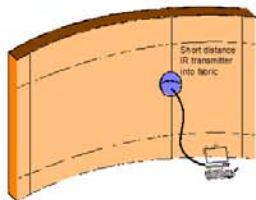
R transmitter and receiver embedded in composite. IR receiver consists of a photodiode

Embedded IR Transceivers

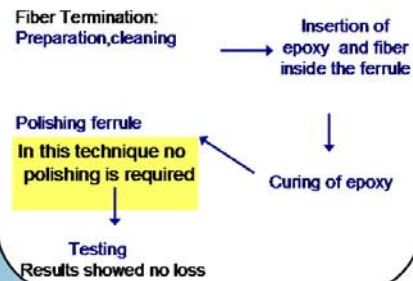


POINT OF APPLICATION

IR Transmitter attached to the side of port.



NOVEL TECHNIQUE IN FIBER OPTIC TERMINATION



FIBER TERMINATION

- > In this technique , bare ferrules are used to terminate the fiber.
- > In comparison with the connectors used today, the size of the ferrules are too small and they can be embedded in composites.

Ferrules used to terminate the fibers



CONCLUSIONS AND FUTURE WORK

- > To miniaturize devices.
- > Fabricate devices that survive composite processing and characterize their performance.
- > Optimize power requirements
- > Minimize number of devices

ACKNOWLEDGEMENTS

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