

UV cure adhesive makes optical fibre feedthrough

[*Ultraviolet curing adhesive-based optical fiber feedthrough for ultrahigh vacuum systems*](#) – J.-F. Clement, D. Bacquet and P. Szriftgiser, Laboratoire de Physique des Lasers, Atomes et Molecules, Universite des Sciences et Technologies de Lille, France.

We were introduced to this technical paper a few days ago by a prospective customer. The authors present an inexpensive, simple, and robust method of making an optical fiber feedthrough for ultrahigh vacuum (UHV) systems. This technique is particularly suitable for cold atom experiments. A drilled standard UHV DN16CF flange allowed them to pass a fiber inside an UHV chamber. An optical UV curing adhesive is used for holding the fiber through the flange and as a vacuum sealant. A vacuum down to 10^{-9} mbar was observed, while the optical insertion loss of the feedthrough was monitored and did not exceed 0.01 dB.

The team used [Dymax OP-61-LS](#); its main application is positioning optical elements. The adhesive can bond different substrates such as glass, metal or plastics. Several properties of this adhesive were required for their UHV optical application. [Dymax OP-61-LS](#) has a low linear shrinkage during UV cure, so that negligible stress will be applied to the fiber during the curing process. It also has a low movement during thermal excursions allowing modest baking. Finally, it is specified as low outgassing.

We would recommend the use of a [Dymax BlueWave 200 UV Spot Lamp](#) for this sort of application. In addition, tests might also be run with [Dymax OP-67-LS](#), which is now our main product for optical assembly alignment where minimal or no movement is required. It has high adhesive strength, low outgassing, very low shrinkage during cure (0.08%), and no movement during cure or thermal excursions. And it cures completely in seconds with UV light.

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Supplied by:

intertronics

INTERTRONICS

12a Station Field Industrial Estate, Banbury Road, Kidlington

Oxfordshire England OX5 1JD

t 01865 842842 e info@intertronics.co.uk

Last updated: October 2018

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