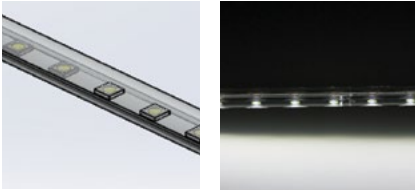


Modular optics

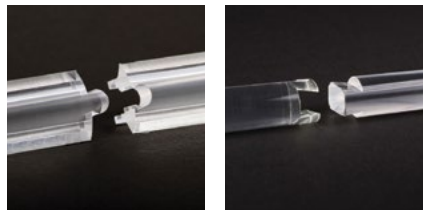


For some applications, very long, thin optics are desired. In plastics, these can sometimes be created through extrusion processing. Current moldable silicones, however, are not suitable for running in this traditional extrusion process. Additionally, the extrusion process limits designers to 2D shapes only. Highly polished surfaces, features, corners, ends or other stops, 3D lenses, etc. are not possible without additional processes.

Modular optics were designed to present a possible solution for applications which need long optical parts. There are two sets of parts included to show this concept, one with rounded end couplers and the other with dove tails. These parts take advantage of several properties of moldable silicones. Firstly, since the material is flexible, parts are made to

snap together at the ends. Additionally, in the rounded coupler design, a pair of slots also allows them to be snapped over an LED strip without additional mounting features. Secondly, moldable silicones have the ability to wet to each other, conforming together to eliminate air gaps.

This wetting reduces reflection losses at the interface, so optical output does not have shadows or bright spots. The rounded coupler sample is linear to fit on an LED strip. The dove tail coupler could also be designed and molded with angles, crosses and splits, and the part could be end-lit and include extraction features at various points as desired. Optionally, a drop of curable material can also be put in the joint to prevent disassembly and make an even more robust joint.



Points to note:

- Parts slip together and snap onto LED strips; no additional mounting is needed.
- Complex cross sections can be very accurately produced.
- Features for light extraction, diffusion, etc. can be molded where needed; they don't need to be continuous as they would with an extrusion.
- Overmolding or co-molding with white reflective material is possible to increase design flexibility and reduce processing costs.

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