Multi-Material Injection Moulding - Distal End of Endoscope

The Invention

Endoscopes are used to observe areas in the body that are otherwise unobservable due to inaccessibility. Medical applications include gastro endoscopy, which allows a doctor to view the inside lining of the throat, the stomach and parts of the intestine, whereas industrial applications include inspection in aerospace engineering. An endoscope typically has a transparent lens at its distal end to allow the image in view to be transmitted to the user. Currently this lens and its housing are produced in separate injection moulding processes and must then be attached to using costly micro-assembly techniques.

A team of University researchers have designed and manufactured a mould tool that uses micro two-shot injection moulding, so that the transparent endoscopy lens is moulded as the first step and an opaque housing is moulded around it as the second step.

Novelty

The advantage in using multi-material injection moulding to produce the distal end of the endoscope is that parts are manufactured in a single step as opposed to using several steps to manufacture and assemble the different sub-parts. This reduces the production costs and production time. It ensures a strong bond between the materials, which also improves product performance and integrity in the field.

Application Fields

An example device was created for use in endoscopes, therefore, it is relevant to the manufacturers of endoscope parts as well as to clinicians who are interested in an improved design solution.

However, the expertise developed in multi-material injection moulding can be applied to any market in which existing plastic parts are currently moulded and contain more than one material, ranging from toys to electronics.

IP Status

A design covering the distal end of an endoscope was registered in April 2016 with European Community Design reference number 003040799-0001.

The team has developed extensive know-how in simulating fluid plastic behaviour during the multi-material injection moulding process and is able to use this to troubleshoot existing processes of develop new ones.

Commercial Interest

We are:

- Looking for commercial partners interested in licensing the design for the endoscope lens assembly.
- Interested in development work with companies which could benefit from multi-material injection moulding to improve product quality and/or manufacturing processes.

The University of Malta offers an e-learning course on topics related to injection moulding. The course is intended for novice and experienced tool makers/designers, plastic part designers and other relevant stakeholders in industry.

Lead Inventor

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The development was executed at and supported by the University of Malta, sole owner of the rights. The university's IP is managed by its Knowledge Transfer Office. Inquiries shall be submitted to knowledgetransfer@um.edu.mt, or further information may be obtained on +356 2340 3466.

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