

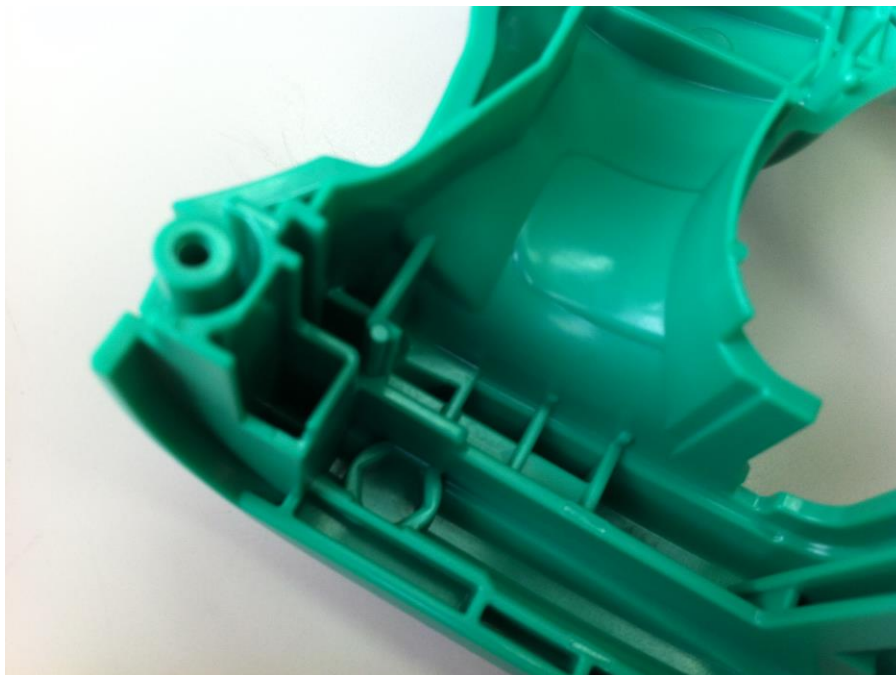
Conformal cooled injection mould tool inserts

A new solution to improve part quality and cycle rates

One of the challenges when manufacturing injection mould tools is how best to incorporate channels that allow even and effective cooling of the tool, to ensure that part quality while reducing cycle times.

The traditional approach to conformal cooling

To date, cooling channels are generally produced as drilled holes running in straight lines through injection mould tool cores and inserts. Bringing these straight runs close enough to the mould surface to provide optimal cooling is impossible when parts have curved or complex shapes, thin profiles or large numbers of intricate features. Additionally, drilled water holes have to compete for space with ejector holes; in box-shaped parts such as enclosures and housings, these need to be located in the same place at each corner. In most cases, cross channels have to be drilled between two parallel channels and then sealed at each end, with 'bubblers' being used to make water run in and out of cores in a plane perpendicular to the drilled holes. These techniques are, however, a compromise aimed at achieving the best cooling possible within the limitations of machining straight holes.



Conformal cooled injection mould tools

What is needed for high-quality results is [‘conformal cooling’](#). In this approach, water channels closely follow the surface contours of the injection mould tool inserts. To date, however, this has been slow and costly to produce for most applications, due to the limitation of the available technology. For example, to engineer conformal channels using conventional subtractive machining, engineers need to build mould tools in a series of layers. Each layer is machined separately, and then stacked and bonded to form a finished tool. This is slow, expensive, prone to failure and unsuitable for many tools.

Metal additive manufacturing

The advent of [additive manufacturing technology](#) now creates new possibilities. Using direct metal laser sintering, powder materials can be formed into complex shapes, which contain cooling channels of almost any shape and size. To date, however, the surface of injection mould tool inserts that have been laser sintered is relatively rough and requires further machining to create a high quality injection mould surface; this adds to time and cost.

Driving down injection mould tool cost

A new hybrid technology now combines additive manufacturing and CNC machining in an integrated system, producing injection mould tool inserts in a single operation. This technology is being offered as a new service from OGM; branded ConformL Cool, it makes true conformal cooling a viable option.

We have the first [hybrid metal additive manufacturing system](#) of its kind in the UK. Steel injection mould tool inserts are built layer by layer by laser sintering, with an automatic secondary CNC machining process providing a precise surface finish. Conformal cooling channels are incorporated as part of the build process, which has an extremely high degree of dimensional accuracy, with a fine finish on both internal and external surfaces. There is generally no need for separate finishing work, which means the process is faster and more economical.

The precision and flexibility of this technology enables channels to be printed in whatever shape or configuration that best matches the required characteristics of each injection mould tool. Channel cross sections can be round, elliptical, rectangular or teardrop-shaped to maximise heat transfer in different situations. It is also possible to incorporate special features that encourage turbulent water flow, to keep channel surfaces smooth and free of trapped debris or fungal growth.

Reducing injection mould lead times

In addition to its inherent efficiency, and resulting cost-effectiveness, the new hybrid technology offers consistent levels of quality. With us being located in the UK, lead times, compared to offshore manufacturing, can be significantly reduced from around 12 weeks from overseas suppliers to just 4 weeks or less.

To find out how OGM can help you with your next project, [contact](#) us now.

- E N D -

About OGM

OGM was established in 1962 and B E Wightman grew the business over the next 40 years through a dedication to high-quality in the products and the service we provide our customers and a commitment to fairness. Today, these values remain at the heart of everything we do. We offer total manufacturing solutions for precision injection moulding, from design consultancy and prototype tooling through to high-volume world-class production. Our customers include international blue-chip organisations, such as Siemens and GE Healthcare, from across a range of sectors, including industrial, electronics, utilities and medical.

For further information, contact: OGM, Oxford Industrial Park, Mead Road, Yarnton, Oxfordshire, OX5 1QU. Email info@ogm.uk.com Web: <http://www.ogm.uk.com/>