A Case Of Eureka!

Low volume production of durable equipment is simplified using Martello's ThinRim Process

High quality plastic caseworks are required in small quantities for many products, either for pre-production series prior to production tooling or for on-going low volume production. The parts must be accurate and robust, and have good mechanical properties and excellent cosmetic finish. Until recently, it has been necessary to commission expensive injection mould tools to obtain sufficiently durable parts, even for small batches.

However, advances in polyurethane resin technology at Martello Limited in Poole have now made these versatile materials suitable for the low volume production of thin walled caseworks and other plastic products, as well as thicker walled parts traditionally produced by RIM processing. These new polyurethanes produce durable, robust parts, comparable to injection moulded parts in their mechanical properties.

New tough production quality UV stable and V0 flame retardant rigid resins have been developed by Martello; both resins can be fully pigmented, eliminating the need for painting of each part. Martello also offer a range of elastomeric resins that are ideal for any part that requires flexibility or tangible properties such as keymats, seals and protective overmoulds.

A typical application is the casework for the Eureka, an advanced leak-noise-correlator produced by Primayer Ltd for the accurate pinpointing of underground fluid leaks, prior to excavation. In the water industry the Eureka can be used effectively on all types of pipe - not only metallic but also plastic, asbestos cement and large diameter mains.

When the Eureka was in its concept stage the search was for a manufacturing process to suit the market requirement of 'low-cost ownership' expected by the customers who hire the equipment. The product is specialised and required in low call-off quantities; therefore what was required was a manufacturing process that would deliver high quality products with minimal outlay on production tooling.

The intended working environment of such an instrument is likely to be incident fraught, demanding high resistance to the legendary hazards of field operation. This, coupled with a need for weather and environmental resistance, meant that the case would have to be robust and durable as well as cosmetically attractive.

The Eureka had originally been designed for aluminium sand casting as the cost of injection mould tools could not be justified over the anticipated sales volumes. However, it was soon recognised by Primayer that Martello's ThinRim polyurethanes not only provided exceptional cosmetic quality but also were more than robust enough for the application.

Using fully pigmented polyurethane resin formulations, Martello rapidly produced durable instrument cases that have proven themselves in service. Martello also suggested an elastomeric overmould, that would encompass the base and sides of the instrument, and would create a 'comfort and perceived ruggedness' reaction with clients. The contrasting colours and material finish of the polyurethane overmould gave the part both visual and tangible product benefits, and had a direct impact on increasing sales.

The polyurethane resins are processed in low cost silicone rubber tools, generated from CNC machined patterns; unlike the early Japanese vacuum casting resins, the new polyurethanes offer greatly enhanced tool life when used with appropriate silicone rubbers. Minor design revisions to the Eureka over the years have been readily incorporated into the machined patterns. The production of units has now reached several hundred and the Eureka2 is an acknowledged worldwide success.

THE THINRIM PROCESS

Martello have developed their own resin processing system, trade named ThinRim™, to produce fully pigmented parts under vacuum more efficiently than conventional vacuum casting systems. The new machine and materials are ideally suited for producing low volume production batches of 50 or more parts.

The CNC machined masters are created direct from 3D CAD data and provide much better accuracy, stability and finish than would be possible with rapid prototyping masters. The patterns are also more durable than SLA parts and require significantly less labour to create repeat silicone rubber moulds.

As a result, Martello are able to absorb the cost of any replacement moulds and only charge their customers a one-off tooling fee.

The generation of the CNC machined master patterns, the low cost tooling and first off parts usually takes less than 2 weeks, making this technology not only a cost effective solution for the low volume production of plastic caseworks and components, but also a rapid means of bringing new products to market.

Martello: www.martello.co.uk
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