

An exceptional rotomoulding for the world's no1 footwear brand

Tasked with the manufacture of an innovative foot measuring device for Clarks' shoe stores, Tecni-Form perfected a rotational moulding and finishing process for a rugged, load-bearing product with outstanding surface quality and dimensional accuracy.

The main foot plate component is produced to dimensional tolerances that are unusually low, for a rotationally moulded shape, and matches the brilliant white, gloss finish of the Apple iPad, which locates inside it.



The Challenge

Designworks Windsor Ltd. is an award-winning product design agency, globally recognised for its creative output and prestigious client list. The renowned retailers, Clarks, approached Designworks to develop a ground-breaking idea, which centred on the use of an Apple iPad, as part of a new, interactive, foot measurement platform for children's shoes.

Now approaching their 200th anniversary in shoe retailing, Clarks have used many methods and devices over the years to help staff in correctly sizing footwear for customers. These have included mechanical, optical and electronic gauges, operated by shoe fitting assistants. With the new design, Clarks wanted to retain the traditional role of the assistant in the fitting process, while using the capabilities and appeal of the iPad to offer precision measurement and a more engaging experience for children.



At a glance

Objectives:

- To help create an interactive foot measuring system for shoe retailer, Clarks.
- To do the footplate moulding.
- To ensure the complete assembly operation and distribution of the end product could be provided.

Challenges:

- Ensuring a uniform wall thickness throughout the moulding.
- To guarantee strength under load.

Results and benefits:

- Clarks won the iF Design Award for Design work.
- Clarks won Oracle Retail Week Award 2015 (The Veredus Customer Service Initiative of the Year).
- Tecni-Form has completed the assembly and distribution of the first 2,500 units to Clarks' UK stores and is now supplying for global outlets.

"Working with our CAD output and foam models, Tecni-Form assured us that a seam-free, complex shape, with reinforcing ribs and undercuts, could be made by rotomoulding."

- Chris Flatt, Head of Manufacturing

The design solution allows the iPad to slot securely into an opening on one end of the foot gauge. The touch-screen function is then used to register the length of the foot when a button is depressed on a sliding bar. This means the main plastic moulding must provide a dimensionally accurate and robust housing, so that the gauge gives a precise measurement each time. In terms of structural integrity, the main body (footplate) of the device needs to show minimal deflection and zero damage under Designworks' test loading of 140kg.

Perhaps even more crucially, in regard to the material used, the concept demands a surface finish comparable with the high quality of the iPad case – glossy and without defects or blemishes of any nature.

With these key requirements in mind, coupled with the projected number of units to be manufactured, the designers were interested in the possibility of rotationally moulding the footplate very early in the evolution of the product design.

The Tecni-Form response

Having previously successfully executed a number of complex mouldings for Designworks, Tecni-Form was the go-to company to consult, concerning the Clarks' iPad Foot Gauge. One particular project, the Gunnebo *Securepod* safe, with an artistic form and finish to attract mainstream consumers, demonstrated that with the right techniques and experience behind it, an intricate rotational moulding could display outstanding strength, surface texture and visual appeal.

Working closely with Designworks, Techni-Form showed not only that the footplate moulding was achievable but also that the complete assembly operation and distribution of the end product could be provided.

"Tecni-Form were absolutely brilliant. Their enthusiasm for the project and contribution to getting the design spot on for the production process were outstanding" - Chris Flatt, Head of Manufacturing

Chris Flatt, Designworks' Head of Manufacturing, explains: *"We knew that the main body of the foot gauge would be difficult to produce. For a 'weight-on' component like this we needed a process that would ensure a uniform wall thickness throughout the moulding, to guarantee strength under load."*

"Working with our CAD output and foam models, Tecni-Form assured us that a seam-free, complex shape, with reinforcing ribs and undercuts, could be made by rotomoulding. This could also incorporate moulded-in captive fasteners, should we require them."



"Occasionally we see examples of the iPad foot gauges that have seen heavy service in Clarks' stores and I have to say they are 'bomb-proof'. We are really pleased with their durability."

- Chris Flatt, Head of Manufacturing

In addition to delivering strength in a lightweight component, the rotational moulding approach had to be very accurate in size and shape. Tecni-Form had to manufacture to a $\pm 0.5\text{mm}$ machining tolerance, to allow a clearance fit between the main body and a steel chassis insert. This eliminated a potential dirt trap on the upper face of the assembly. In production the component is moulded fractionally oversize and a CNC 3D machining station is used to create the correct recess profile to accept the steel plate.

The selected material was medium density polyethylene (MDPE). Whereas the commonly required finish for rotational mouldings is a shot peened surface appearance, Tecni-Form produced a highly polished mould tool and requested a special MDPE powder to reproduce the gloss of the iPad. Raw material suppliers worked with the team to formulate a specific, high brightness, white MDPE rotomoulding powder. The tailor-made formula assisted with the complexity of the moulding shape as well as the surface finish of the product.

“Tecni-Form were absolutely brilliant”, adds Chris Flatt. “Their enthusiasm for the project and contribution to getting the design spot on for the production process were outstanding. When we came to test the foot gauges in compression, they took the maximum 350kg test rig load, let alone the 140kg we needed.”

“Occasionally we see examples of the iPad foot gauges that have seen heavy service in Clarks’ stores and I have to say they are ‘bomb-proof’. We are really pleased with their durability.”

The success of the Clarks’ iPad Foot Gauge design resulted in a prestigious iF Design Award for Design works and the Oracle Retail Week Award 2015 (The Veredus Customer Service Initiative of the Year) for Clarks.

Tecni-Form has completed the assembly and distribution of the first 2,500 units to Clarks’ UK stores and is now engaged in supplying orders for outlets around the world.

