DCA

Innovative equine fencing system

- Elimination of post moulding processes significantly reduces manufacturing costs
- Quick and easy assembly reduces installation costs
- Discrete assembly detail and a stream-lined form help provide an uncluttered appearance when assembled
- Custom designed polymer spring enables fencing system to accommodate thermal expansion
- Cosmos FEA software used to optimise mechanical performance of polymer spring clip and the t-piece connector
- MoldFlow sofware used to optimise component design

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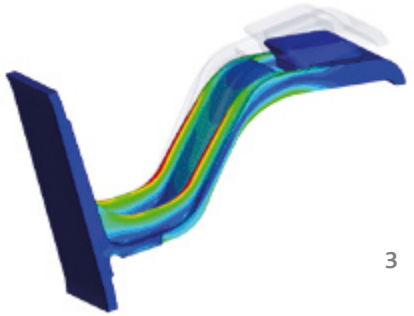

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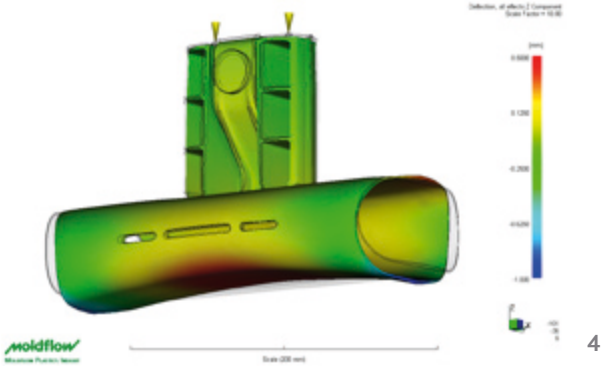

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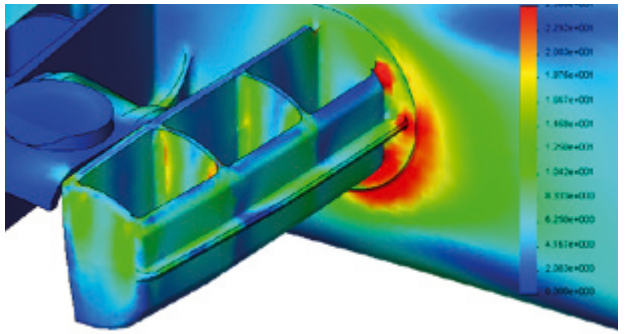

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Duralock produce a well established range of racecourse fencing systems for a global market. Although successful, Duralock felt their current systems were too costly to produce and labour intensive to install. Looking to improve on these shortcomings Duralock approached DCA to help them design an all new oval rail connecting system.

Early sketch models were created in CAD to explore alternative means of supporting the rail and assembling the fencing system. FDM rapid prototyped plastic parts were produced to enable ergonomic factors, such as the ease of assembly, to be better considered and to aid the selection of a preferred concept.

A key part of the design brief was to develop a means of allowing for the thermal expansion of the rail that could be exposed to a broad range of temperatures. DCA designed a nylon spring (2) that is assembled and retained in between the lengths of rail, ensuring sufficient room for expansion.

The re-design of the fencing system also presented the opportunity to improve the aesthetics of the fencing system. Once assembled, the new system provides a visually cleaner and more appealing form. The new form also helps to improve the safety of the fencing by minimising edges and projections to significantly have the potential to harm horse and rider in the event of a cheek space collision.

Prior to installation, the fencing system is required to pass strength tests carried out by the UK Jockey Club. Finite Element Analysis (FEA) tools were used to assess and tune the strength of key elements as the design evolved, giving confidence that the physical parts would pass the Jockey Club's tests.

MoldFlow software was used to simulate the injection moulding process enabling DCA to fine-tune the geometry resulting in a part with minimal distortion and sink marks.

The new fencing system has now been installed in a number of racecourses in the UK and Middle East and has helped Duralock strengthen it's position in the marketplace.

1. T-piece connector - view of underside
2. Thermal expansion spring
3. FEA of stress distribution in T-piece spring clip
4. MoldFlow plot of part shrinkage at scale factor 10
5. FEA of stress distribution in T-piece location features

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