

PROJECT : **Evolution**

TITLE : Redefining the benchmark sleep system

CLIENT : Design Mobil

PROJECT CODE : 0205

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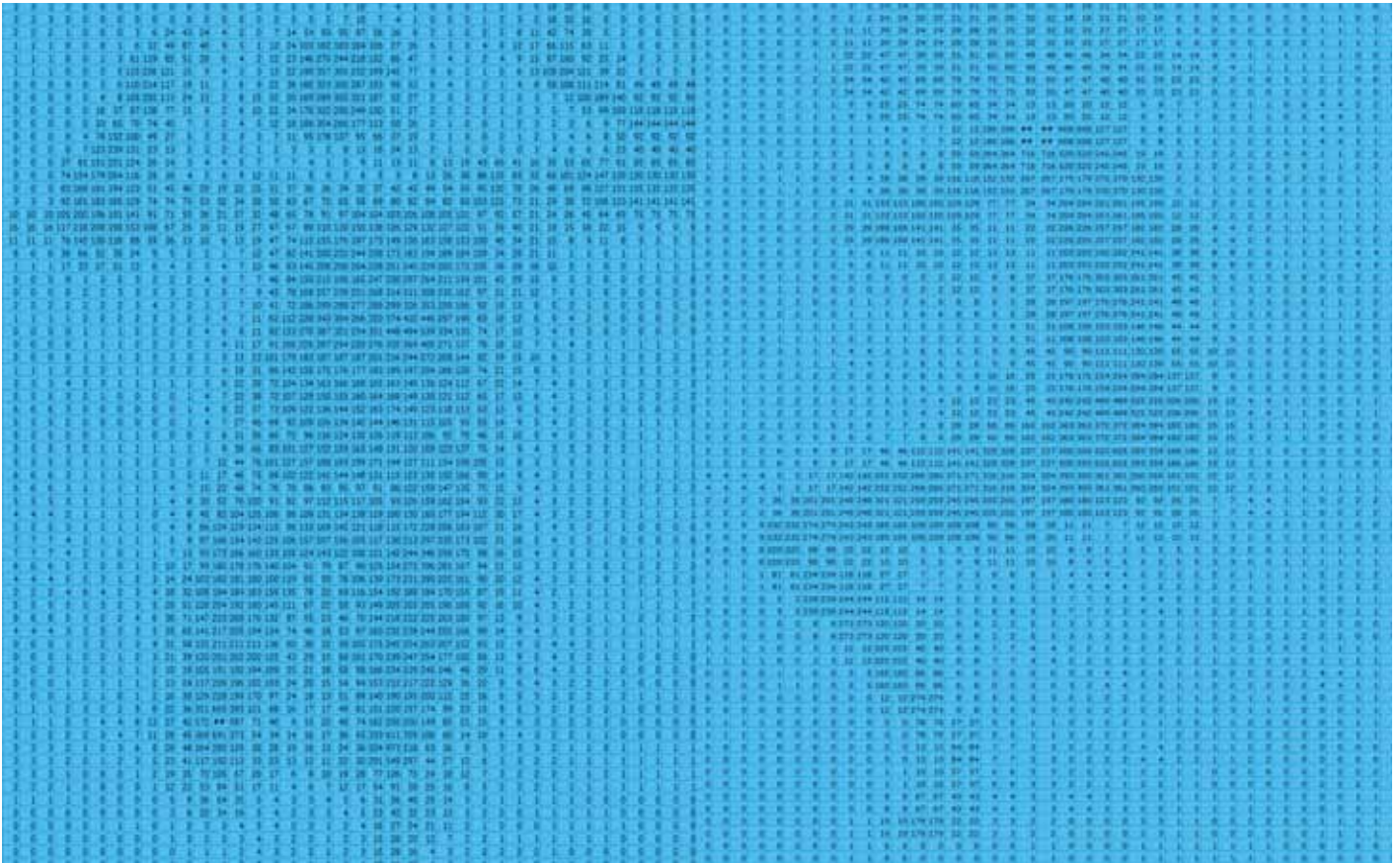


Figure 1. Data Pressure Map

# The Brief or Problem

The existing Design Mobil Sleep system had been in production for in excess of 10 years. In that time the competition in the flexible slot bed market had grown since its introduction. An evolution of the support system (shoes, pins and slats) had to be developed to keep DM ahead of the competition.

Figure 2. Evo Clip Diagram



One of the difficulties was retaining the dynamics of a very successful sleep system, and if possible, improving its performance. The system had effectively helped underpin the companies growth and great reputation so this was a crucial element of the design requirements.

Design Mobels ISO 14001 certification and responsible approach meant particular attention was placed on reducing the products environmental impact.

# The Solution

A significant development of the existing design was generated without compromising the performance of a historically effective sleep system.

The new shoes created a dynamic and flexible platform that is able to respond to a users movement with impeding it.

It resulted in a new material being selected. The use of a Hytel elastomer enabled the wall sections to be thinned right down and an almost 50% weight reduction. This resulted in cost savings that enabled a payback period of under a year for high quality production tooling.

The 'clipping' nature of the two shoes (super and deluxe) meant that DM no longer had to stock both systems



Figure 3. Evo Shoe Assembly

in their bedding range. Although unquantified this was expected to yield excellent benefits for the company in both New Zealand and Australia. Whilst the redesigned Pin had greater holding power than the previous model helping to eliminate the problem of pins coming out of timber rails.

There were a range of improvements in the products sustainability. By moving to a 4 cavity tool from a single cavity it decreased the embodied energy in each item. ISO material classifications were also added to increase the chance of the material being recycled correctly. Whilst the most significant was the simple reduction in volume.

## The Process

The process of developing this product started with the creation of a business case that showed the benefits of moving to newer multicavity tooling and new materials.

Once the project had been approved a wide range of initial concepts were drawn up that experimented with different support options. These concepts were then thinned out and several of the options were put through stress tests using FEA on CAD models. This proved a real challenge given the nature of the elastomeric materials.

The concepts were then prototyped in Flexible PU and tested lightly to see if the team was on the right track. Several iterations later we arrived at a robust general shape with an integrated clip.

With the lifespan requirements of the product an essential component of performance the product had to be tested in its final material prior to production to ensure that it met the performance standards. A prototype tool was commissioned in Australia.

This simple tool was used to manufacture samples that

were put into beds to test informally and samples that were put into full cyclical and structural tests at Scion in Rotorua. The tests were designed for the purpose and required 40,000 cycles of a 25 kg load on a single slat. This simulated an active 10 lifespan above the threshold of expected loading.

These test proved that the new system had a slight edge in durability over the existing system and informal reviews gave a green light to begin the refinements through to production.

Vertex Pacific were chosen as the supplier after a selection process and a supply agreement negotiated for Design Mobil that would give them high quality, stable supply and competitive pricing.

The Vertex toolroom produced 3 high quality tools that were commissioned and put into production in 2004.

## Conclusion

The systematic process of developing this functional product managed the risk and created a great improvement on the existing system.

The product created cost benefit, reduced environmental impact and created a better looking more sophisticated product that complemented the Design Mobil brand and ethos.

Figure 4. Evo Shoe Flexibility



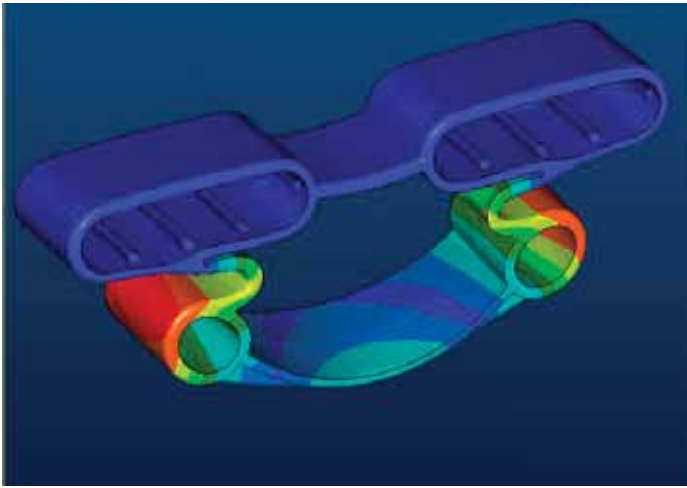


Figure 5. Shoe fully extended and showing loading

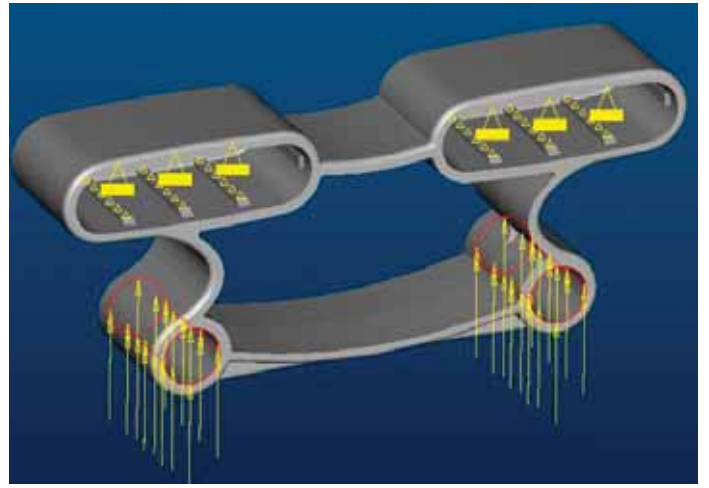


Figure 6. Evo shoe and pin

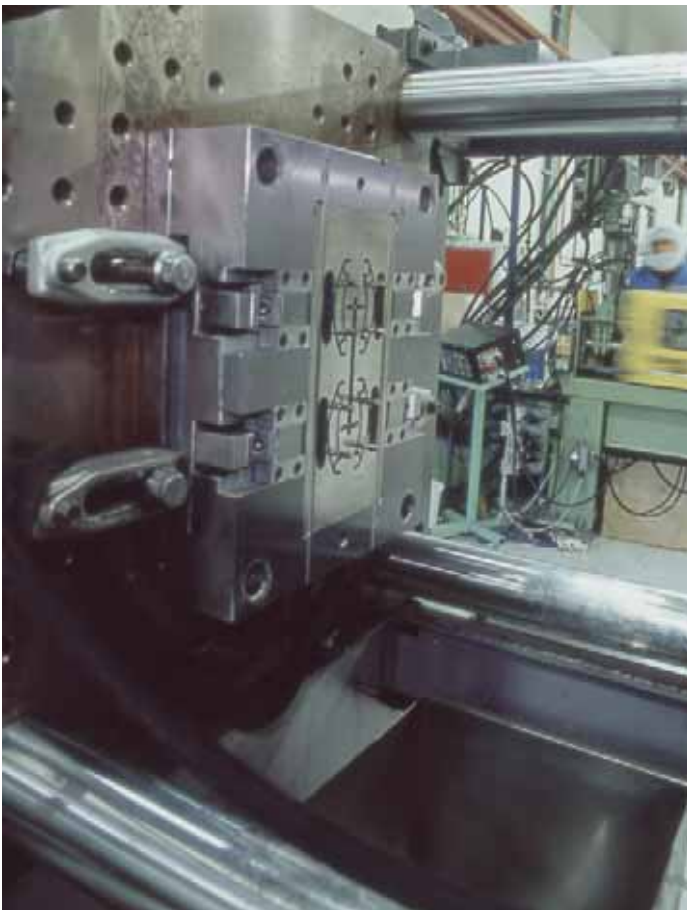


Figure 7. Evo super tool

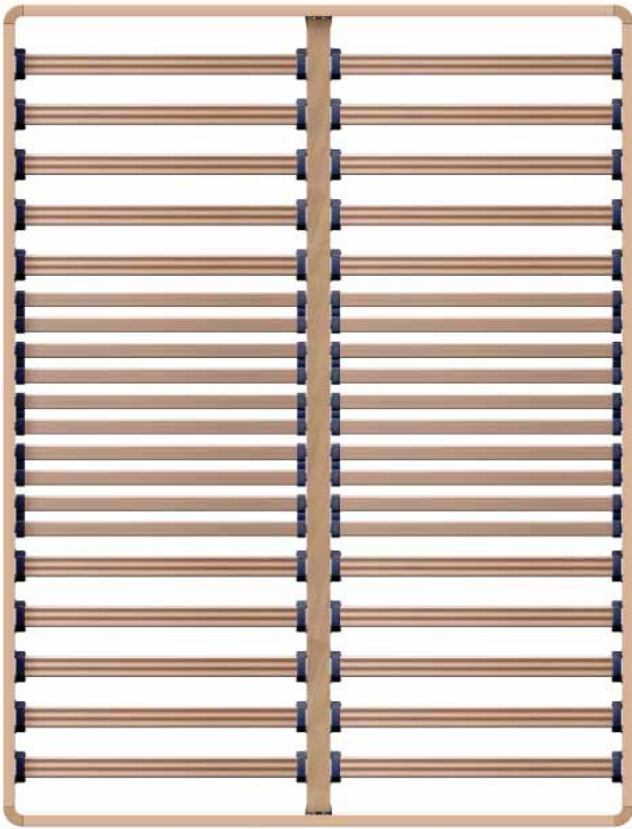


Figure 8. Evo Super Deluxe frame and shoe variations



Figure 9. Evolution bed frame and mattress



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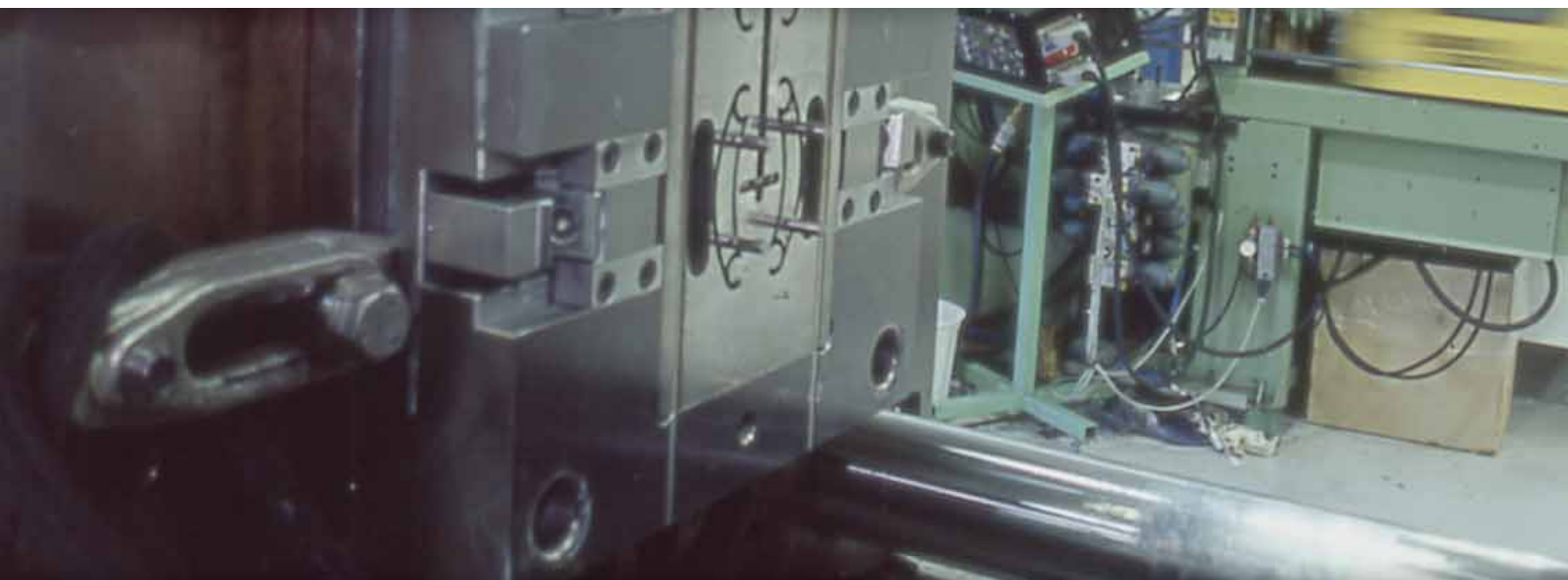
In the six years since Locus was started we have built a reputation for deep research, original design and effective implementation. Our approach to sustainability has been pragmatic and practical, we simply aim to address these issues on a daily basis for both ourselves and our clients benefit.

This is achieved with simple design strategies, through to more advanced analysis using life cycle assessment and systemic analysis. As a team we have

an overarching commitment to sustainable product design (SPD) from research into SPD through to commercial applications of the products that we design.

Our focus has been on research and development rather than just design; we drive to deliver a basic point of difference by using research to build a platform for product development and engineering. We believe in the strategic use of design on a short, medium and long term basis.

Locus has a client base that extends from New Zealand to the UK and has an informed international outlook.



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