

## Interior Concept with Light Centre Console



Dräxlmaier Group's new X<sup>2</sup> centre console architecture opens up great potential for lightweight design. Thanks to its integral design, this innovative product weighs 30 % less than typical centre consoles generally installed in mid-size vehicles today. Numerous studies confirming series production readiness have already been completed.

### AUTHORS



**Dr. Isabella Schmiedel**  
is Director of Interior Advance Development for the Dräxlmaier Group in Vilsbiburg (Germany).



**Dipl.-Ing. Manfred Winklbauer**  
is Department Head of Light and Product Innovations in Interior Advance Development for the Dräxlmaier Group in Vilsbiburg (Germany).



**Lion Pfeufer**  
is Online Editor of the Corporate Communications department in the Dräxlmaier Group in Vilsbiburg (Germany).



**FIGURE 2** Exploded view of a centre console with conventional support element design (structural component shown in red)



nated, and the reinforcing interior elements can be reduced to a single component, **FIGURE 3**.

The closure on the armrest is also eliminated, which further supports the principle of lightweight design. This is replaced by an innovative opening concept driven by a special spring. The base configuration, which is the lightest, can be upgraded with an armrest height adjustment feature, if desired. The modularity of the X<sup>2</sup> centre console comes into play here: The upgrade only requires two easily installed additional parts on the console sides.

### LIGHT MATERIALS

Another important aspect is the use of lightweight materials in the X<sup>2</sup> centre console. For example, the two lightweight design side support elements are produced using a Thermoplastic Foam Moulding (TFM) process. Plastics reinforced with natural and glass fibres are also used. The storage compartment and the panel are made, for instance, of the light, sustainable composite material Natural Fibre Polypropylene (NFPP). Overall, the interior concept is roughly 30 % lighter than a conventional centre console

currently found in mid-range vehicles. This corresponds to weight savings of around 1.5 kg. The new laminated design and the centre console's tool-free installation help optimise costs.

### STYLING POSSIBILITIES

At the same time, the X<sup>2</sup> centre console permits alterations according to customer requirements. For example, side padding can be subsequently installed in the knee area. The styling of decorative elements and the decorative panel can also be varied. Decorative styling of

plastic, aluminum or wood is possible. Special features such as applications or decorative designs on the armrest covering as well as premium leather stylings are conceivable. In other words, this is a huge leap towards maximum styling freedom. However, the lightweight design potential is best achieved in the entry-level variants.

## SERIES REQUIREMENTS SATISFIED

The goal is to ready the X<sup>2</sup> centre console for series production. The simulations required for this goal have already been completed. These include testing of warping properties, filling pressure, crash behaviour and stiffness load cases. For the latter, the forces acting on multiple locations of the X<sup>2</sup> centre console were determined using the finite element method, **FIGURE 4**. The result: All values comply with the standard. The same is true of the other simulations mentioned, all of which satisfy all OEM requirements.

The ease of assembly was also tested for series production compatibility. For this the developers focused on clip assembly ensuring efficient production without compromising on crash or stability requirements. An interlocking clamp mount enables screw-free fastening in the vehicle.

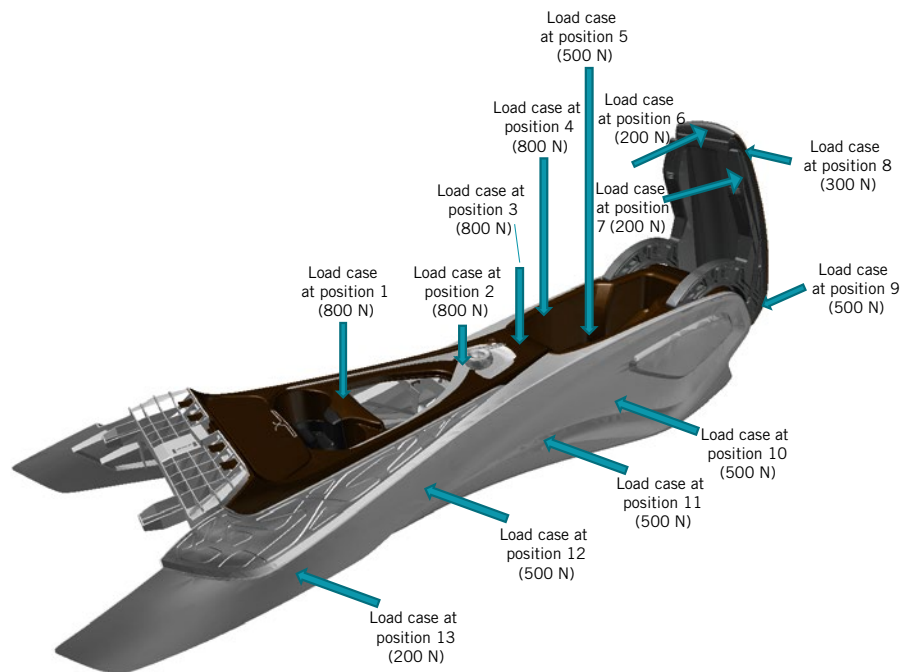
## SUMMARY

Lightweight design offers huge potential. This is especially true when applied inventively as is the case with the integral design approach of Dräxlmaier Group's X<sup>2</sup> centre console. It is a good example of systematic lightweight design, thanks to a combination of the surface and structure by merging the shell and support element design approaches. In conjunction with topology optimisation of the components in the interests of constructive lightweight design and the use of light materials, it is possible to achieve weight savings of roughly 30 %. In its base configuration, the X<sup>2</sup> centre console is roughly 1.5 kg lighter than centre consoles currently installed in mid-size vehicles.

Numerous analytical studies for confirming the series production compatibility of the interior concept have been completed, and several patents have already been granted. A number of OEMs have already shown interest.



**FIGURE 3** Exploded view of the new X<sup>2</sup> centre console with an integral design that combines the outer surface and formative structural elements into a single unit with little parts



**FIGURE 4** FEA load case simulation – pressure was applied to the X<sup>2</sup> centre console with a piston to simulate load cases; the result: the measurement values in N exceed the required values at all 13 positions

## REFERENCES

- [1] N. N.: Mittelkonsolen – Aktuell Produkte. In: ATZ 116 (2014), No. 11, pp. 30
- [2] Hofacker, A.: Leichtbau: Mit integraler Bauweise spart Dräxlmaier Gewicht im Innenraum. [Lightweight Design: Dräxlmaier Saves Weight in the Inte-

rior with an Integrated Design.] In: Springer für Professionals, <http://www.springerprofessional.de/mit-integraler-bauweise-spart-draexlmaier-gewicht-im-innenraum/5302332.html>, access date: 25 November 2014