Fig. 1: Air chambers of the pneumatic comfort system. © 2012 Lantal

Air cushion systems for comfortable flights.

To achieve the highest possible level of comfort for air passengers, Lantal from Switzerland developed a pneumatic air cushion system. This system replaces the customary cushion foam with air-filled chambers. Powerful maxon flat motors take care of filling the cushions with air.

Long flights can be very strenuous for passengers – this makes an aircraft seat that offers all imaginable comforts all the more desirable. Swiss textile manufacturer Lantal from Langenthal has developed a pneumatic comfort system (PCS) that replaces the customary plastic foam in the seat cushions with air-filled chambers. These air-filled seat cushions provide comfort both in sitting and in sleeping position. The pneumatic seat cushion automatically detects the shape of the passenger's body and the air-filled chambers adapt to the individual posture of the passenger. Simultaneously, the firmness of the cushion can be adapted individually – for instance, a bit more firm for eating or reading, less firm for relaxing and cozily soft for sleeping, with optimal firmness for full-body support. Thanks to the high adaptability of the air-filled chambers, the seat cushions eliminate pressure points, which are frequently a problem when sleeping or sitting on long-distance flights.

The comfort system has proven itself in more than 10 million passenger flight hours within three years on 27 aircraft. Since 2009, all Business and First Class seats in the long-distance aircraft of Swiss International Air Lines have been equipped with the pneumatic comfort system. Other large airlines, such as Lufthansa, have followed suit and will be offering their customers the comfort of the air-filled seat cushion system from 2012. The seats in this comfort class also have built-in massage systems that make the flight even more pleasant for the passenger. In addition to being able to offer the passengers more comfort, the airlines can also save weight - and thus costs. Because the seat cushions are much lighter than customary solutions.

Replacing the previously used foam in the aircraft seat with Lantal air cushions results in savings of 1.5 to 3 kg per Business Class seat and 3 to 5 kg per First Class seat. The lower weight reduces the operating costs of the air carriers, such as the use of fuel.

Author: Anja Schütz, © 2012 maxon motor ag

Figure 2: The air cushions, with individually adjustable firmness, offer high comfort for aircraft seat.
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maxon motors make sure the air pressure is just perfect

The motors are a central component of the air cushion system. Each aircraft seat with integrated pneumatic air cushion system is equipped with a maxon motor. A single brushless maxon EC45 flat motor per seat drives the vane pump of the air cushion. By varying the filling of the air chambers, the passenger can steplessly switch between firm and soft settings. Additionally, an adjustable lumbar support with massage program is available. Another advantage is that the seat cushions with the air system have a higher life span than standard seat cushions. The EC45 flat motors that were chosen for the comfort system have an output power of more than 30 W and only weigh 75 g each - a very important criterion for use in aircraft. Lantal decided on maxon motors because they are not only small and powerful, but also, and in particular, highly accurate and reliable. And that is extremely important for achieving perfect comfort 10,000 m above the face of the earth.

Lantal's comfort system flies in solar airplane

The pneumatic air cushion system is not only used in passenger aircraft – the technology is also in high demand for very special cockpits. Lantal supports the challenging Solar Impulse Project of Bertrand Piccard and André Borschberg, as official supplier.

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Titel: 3409 Zeichen, 652 Wörter, 6 Abbildungen

Figure 3: Each aircraft seat with the Lantal air cushion system is equipped with a maxon EC45 flat motor.
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Figure 4: The vane pump of the air cushion, with integrated motor.
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Figure 5: Replacing plastic foam with air cushions saves up to 5 kg of weight per seat. © 2012 Lantal

Figure 6: The exceptional comfort of the maintenance-free air cushions is retained throughout the life span of 6 to 8 years. © 2012 Lantal

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