

## Aircraft inspection made easy: Fly safely with "Morfi" and igus bearing technology

Innovative aircraft inspection robot reduces maintenance times - igus plastic bearings reduce weight

Safety is particularly important in air travel, both on the ground and in the air. Aircrafts are therefore carefully inspected and maintained. To reduce ground handling times and to increase safety through improved maintenance, the Lufthansa Technik AG and the Institute of Aircraft Production Technology at the Technical University of Hamburg in collaboration with two industrial partners have developed the mobile robot "Morfi" for the automatic inspection of the aircraft outer skin. The renowned igus bearing technology helps to save weight and also offers new design possibilities.

Around ten million flight movements a year in European airspace call for the highest safety standards for man and machine. Aircrafts are serviced with great care, in order to detect even the smallest defects. As part of two research projects, Lufthansa Technik AG and the Institute of Aircraft Production Technology at the Technical University of Hamburg have developed, in collaboration with two industrial partners - the edevis GmbH and IFF GmbH, a robot that performs the thermographic crack checks on the outer skin of commercial aircrafts and which will replace the former complex procedures.

The inspections carried out manually so far call for the utmost attention and thoroughness of the staff, which leads to time-consuming and cost-intensive ground handling of the aircraft. One solution for the efficient performance of such inspections is "Morfi" (Mobile Robot for Fuselage Inspection), which moves independently on the aircraft fuselage and whose thermographic measuring sensor can be precisely positioned in the desired inspection areas. By means of a short, electrical impulse an inductor (coil) heats the surface by a few kelvins. At the same time, IR images are recorded with an IR camera. An employee can then quickly and easily identify potential cracks on a screen.

**The igus bearing technology reduces weight by 15 percent**

Since the robot also moves vertically and in an overhanging position, the attainment of a low dead weight had a high priority in the development. Carbon fibre reinforced plastics (CFRP) are therefore used with high-strength aluminium and tribo-optimised igus high-performance plastics. Just with the use of lubrication-free and maintenance-free drylin W linear guides, igubal spherical bearings and iglidur plain bearings, the total weight of the robot could be reduced by about 15 percent. At the same time, the igus products gave the developers a high degree of design freedom. Thus, the tool-holding area made of CFRP could be easily connected to the iglidur bearing bushes installed in the arms.

**Captions:**



**Picture PM4716-1**

Mobile robot for aircraft inspection from the Institute of Aircraft Production Technology (IFPT) at the Technical University of Hamburg (TUHH) in use on the outer facade of a Boeing 737 of the Lufthansa Technik AG. (Source: Institute for Aircraft Production Engineering (IFPT) at the Technical University of Hamburg (TUHH))

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**ABOUT IGUS:**

igus GmbH is a globally leading manufacturer of energy chain systems and polymer plain bearings. The Cologne-based family business has offices in 35 countries and employs around 2,950 people around the world. In 2015, igus generated a turnover of 552 million euros with motion plastics, plastic components for moving applications. igus operates the largest test laboratories and factories in its sector to offer customers quick turnaround times on innovative products and solutions tailored to their needs.

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