

ROBOKOPTER

INCREASING DESIGN RE-USE AND DECREASING DESIGN-TO-MARKET TIME WITH SOLIDWORKS



Since switching to the SOLIDWORKS ecosystem in 2012, RoboKopter has been able to create unique and competitive solutions and decrease their total design-to-market time by 30 percent.

RoboKopter

Challenge:

Design a six-propeller RoboKopter platform for surveying tasks. The project involved designing a structure of a load-bearing frame for a six-propeller unit capable of carrying various sets of cameras.

Solution:

Implement SOLIDWORKS Premium and SOLIDWORKS Simulation solutions.

Benefits:

- Shortened completion time for single order by 50 percent
- Decreased design-to-market time by 30 percent
- Reduced production costs by 30 percent
- Cut adjustment costs by 50 percent
- Increased design re-use by up to 70 percent

HISTORY OF INNOVATION

Warsaw-based RoboKopter produces remote-controlled flying platforms used mostly for aerial shots and videos. Their services are used in the power engineering and gas industry; crisis management; civil engineering; and in agriculture, forestry, and environmental protection. The company was established to combine their experience in designing unmanned machines, their passion for flying, and the ability to bring innovative ideas to the market.

RoboKopter's multi-propeller flying platforms are unique. Each of the products is designed with careful attention to every detail, constructed with the best materials, and equipped with the highest-quality cameras. Because RoboKopter uses the latest available technologies, the company's products are cheaper and more efficient when compared to similar services provided by planes and satellites.

RoboKopter designers have been working with SOLIDWORKS® Premium and SOLIDWORKS Simulation since March 2012. SOLIDWORKS Simulation is the most frequently used application at the company.

"We always start working on a design by drawing a simple structure of a product to visualize its approximate shape," says Artur Książek, RoboKopter board member responsible for the production process. "As the project moves forward, we can make adjustments and meet our clients' expectations on an ongoing basis. Before we began working with SOLIDWORKS solutions, we had to send a finished design with documentation to the factory every single time. It was only after we received the first prototype that we could see what corrections were needed in the structure so we could integrate them into the design."

WORKING WITH SOLIDWORKS YIELDS RESULTS

RoboKopter's engineers stress that since they started using SOLIDWORKS solutions, it has been much easier for them to achieve and reconcile the three most significant parameters that make a perfect design:

1. Weight, which is of crucial importance for the time an unmanned aerial vehicle (UAV) spends doing aerial work.
2. Rigidity, which is necessary for flight stability and maintaining the correct position during work.
3. Size, which is critical in the design of the RoboKopter platform body so that all the camera feed equipment and drive electronics fit into its small-sized interior.

According to Artur Książek, "The greatest benefits our company has from using SOLIDWORKS are limiting the weight of the equipment we manufacture, increased general output of the whole team, and using SOLIDWORKS Simulation to assess the structure of a UAV being developed without building a prototype, which saves time and the costs of material."

ACHIEVING DESIGN GOALS AND OBJECTIVES

RoboKopter products comprise approximately 300 parts. The main materials are carbon fiber, Kevlar®, nylon, titanium, polycarbonate, ABS, and aluminum. Three engineers work on a single design and the work takes about three weeks, which translates to a 50 percent decrease in workload per order. The design-to-market time has been shortened by 30 percent. Production costs have also been reduced by 30 percent. Costs of adjustments and modifications to designs are now 50 percent lower. The number of design errors has decreased fivefold. Work with SOLIDWORKS has also allowed RoboKopter to considerably shorten the time spent previously on searching for data and files. As a result, developing designs that involve a large number of files is no longer an issue. General production costs have dropped by 20 percent.

"Since we switched to SOLIDWORKS, we have been able to come up with unique and competitive solutions. We create designs, their documentation, and simulations using a single application. Our company's top priorities include high-quality products, high-end technology, professionalism, and rapid growth. SOLIDWORKS helps us accomplish these priorities and develop new objectives."

— Artur Książek, RoboKopter Board Member

STAYING AHEAD OF COMPETITION

The first concept to be worked out using SOLIDWORKS was a remotely controlled, eight-propeller flying platform. Since then, RoboKopter has completed work on two additional projects. SOLIDWORKS solutions have increased the possibility of re-using designs by approximately 70 percent. Since the purchase of SOLIDWORKS solutions, creating comprehensive, professional technical product documentation has made the process of applying for ISO certificates much easier.

With SOLIDWORKS solutions, RoboKopter was able to design a structure that was rigid enough for various types of cameras to be mounted on it (video, thermographic, and multispectral). By using SOLIDWORKS Simulation, the company verified that the structure was both lightweight and sufficiently rigid. The collision detection tool predicted the majority of possible installation issues prior to production.

“What matters a lot in our job is that our products are functional enough to meet the many expectations of various clients,” says Artur Książek. “Since we switched to SOLIDWORKS, we have been able to come up with unique and competitive solutions. We create designs, their documentation, and simulations using a single application. It’s both convenient and fun. Our company’s top priorities include high-quality products, high-end technology, professionalism, and rapid growth. SOLIDWORKS helps us accomplish these priorities and develop new objectives.”

Focus on RoboKopter

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