

## APPLICATION REPORT

### *3D Rapid surveying of Solar Panels at Eurocopter Deutschland GmbH with the mobile 3D Industrial measurement system DPA-Pro*

At Eurocopter Deutschland GmbH the testing under load of solar panels is part of a vast standard testing routine. In this context, parameters for stiffness and flatness of the panel are also determined.

To produce the required measurements, Eurocopter now relies on the Aicon photogrammetric measurement technique using the fully mobile 3D measurement system, DPA-Pro.



DPA-Pro Measuring System

#### *The measurement task*

When testing solar panels, both stiffness as well as flatness are determined by measurement in burdened and unburdened condition. For doing so, the object had to be transported to a co-ordinate measurement machine (CMM). On this CMM, both the test and the measurement had to be performed. The dimensions of the object of approx 2 x 2.5 meters or 4 x 2.3 meters made a mobile measurement system highly desirable.

#### *Rapid measurement with DPA-Pro*

When using the mobile 3D industrial measurement system **DPA-Pro**, measurements can now be carried out at the testing site. To determine the stiffness, the panel is placed on the ground and fixed in each of its four corners.

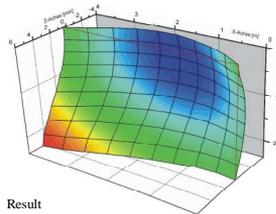


Measurement

Then, the necessary quantity of retro reflecting target points is fixed followed by the measurement in unburdened condition.

To check stiffness, a weight of approx. 5 kilos is placed in the center of the panel and a new measurement is made to record the deformation which ranges between 10 to 20 mm.

In a third test, the flatness of the panel is measured. It is hung up by two corners of the longer side, a condition closest to that in space. After it has come to a rest, the measurement can be started.



Result

With a high resolution digital camera the pictures are taken in minutes without using a tripod. The ring flash which is fixed on the camera assures the even illumination of the retro reflecting target marks.

#### *Calculating the 3D co-ordinates, graphical output of results*

The evaluation of the measurement pictures and the calculation of the 3D co-ordinates is an automatic process in the **AICON 3D Studio** with **DPA-Pro**. For the user, it is not necessary to interact during the photogrammetric calculation procedure. The results are combined in a standardised co-ordinate system. Within the **AICON 3D Studio**, the deformation vectors between burdened and unburdened condition are calculated. The graphical output of **AICON 3D Studio** makes it easy to interpret the results and to produce the required measurement protocols.

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