Development of non-contact non-destructive systems for control of geometric dimensions, shapes and mechanical properties is one of the important areas in the development of modern research and industrial control and measuring equipment. One of the leaders in this area is Dantec Dynamics from Denmark. The company has its roots in the electronics development department established by Dansk Industri Syndikat (DISA) in 1947. For 70 years Dantec Dynamics has been developing new measurement technologies, cooperating with the world’s leading scientific centers and associations, including CECOST of Lund University (Sweden), IUSTI (France), Bergakademie Freiberg (Germany), ASNT (USA), BSSM (United Kingdom). In Russia, the equipment of Dantec Dynamics is represented by Novatest. At the Control 2017 exhibition in Stuttgart (Germany), Christoph König, International Sales Manager, told us about the solutions of the Danish company.

DIC is based on the analysis of optical monochromatic images, obtained with a special set of cameras, with the calculation of spatial positions of each point on the object and the creation of 3D models of the object. DIC is used in the electronic speckle pattern interferometry (ESPI).
Mr. König, what developments of Dantec Dynamics are of greatest interest for electronics and mechanical engineering?

I would like to note the systems for optical non-destructive testing and measuring of mechanical stresses and deformations based on Digital Image Correlation (DIC), Laser Shearography and Electronic Speckle Pattern Interferometry (ESPI).

The DIC method is based on the analysis of optical monochrome digital images obtained with the cameras placed around the object, with the calculation of the spatial position of each image point and the creation of a 3D contour of the object. DIC is applicable for almost any materials in tensile, torsional, bending tests in static and dynamic modes, allowing to evaluate deformation and displacement of the object under load in three dimensions. The size of the measurement area can be from square millimeters to square meters. The system supports up to eight high-speed cameras, operating at speeds up to 1 million frames per second. Displacements and deformations are displayed in real time in a three-dimensional image. We produce several series of systems that implement the DIC method and are designed to measure deformations of a different nature in engineering, semiconductor industry, materials science and other fields.

Laser Shearography is an optical method that is widely used for the rapid detection of defects in metal and composite products. The principle of control is based on interferometric comparison of the geometry of the surface in the initial state and under the influence of heating, vacuum, ultrasound or vibrations. The method makes it possible to detect various structural disturbances, for example, disbands, delaminations, cracks, inhomogeneities, etc. Heating excitation is optimal for controlling metal sheets, CFRPs and GFRPs. The vacuum excitation is preferable for testing materials with honeycomb structure, sandwich constructions, foams, plastics. Vibration excitation is used for frequency analysis in turbomachine testing. Laser Shearography is suitable for controlling objects of various sizes and shapes and is widely used in the aerospace, automotive, power, shipbuilding, and textile industries. Deformations
and defects are detected in real time with a spatial resolution up to units of nanometers.

Electronic Speckle Pattern Interferometry makes it possible to measure deformations and stresses of objects of various shapes and virtually any materials. We offer ESPI systems for measuring the Young’s-Modulus and Poisson Ratio in 1D, 2D and 3D modes. They can be used in tensile tests, in fracture and deformation mechanics, creep analysis and thermal expansion measurements. Solutions for quality control in electronics, automotive industry and mechanical engineering are developed.

**What are the advantages of Dantec Dynamics’ solutions?**
We offer fully functional, highly integrated systems with the user’s required degree of automation, which are created to solve practical problems in the field of measurement and quality control in industry and scientific research. At the same time, we develop and produce all the main components, including sensors and lasers. An important advantage is the ease of integrating systems into workflows through the use of standard interfaces and open architecture. In particular, the principle of an open, freely configurable platform is implemented in systems that implement the Digital Image Correlation technology.

**What is planned to improve in nondestructive testing technologies?**
In the DIC area, spatial and temporal resolution will improve. In general, an important task is to create easy-to-use measuring systems adapted to industrial tasks. To do this, we will simplify the setup process and optimize the software interface.

Интервью: Дмитрий Гудилин