



# Focus on Applications

## PC-DMIS Off-Line: The Virtual Measuring Machine

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The PC-DMIS for Windows measurement software includes an off-line programming environment that allows you to create measurement programs even if you do not physically have a measuring machine and part available. This off-line functionality remarkably increases the efficiency of the dimensional control procedures since you only need to use the machine for the measurement and testing of part programs created in off-line mode.

Using powerful 3D animation tools, you can simulate the whole measurement environment including the machine, sensors, part, and fixturing elements.

From the same CAD part definition, you can generate and make changes to several measurement programs using PC-DMIS off-line. PC-DMIS provides the exclusive use of Direct CAD Interfaces (DCI) which allows direct access to the CAD database without the need for intermediate translations.

### *Funderia Condals of Manresa (Barcelona)*

The Funderia Condals (foundry) specializes in the production of castings for the automotive industry, in particular for braking systems.

The company was founded in 1976. It is certified to the most stringent quality standards (TS-16949, ISO-14001, EMAS) in order to be included among the suppliers of major automobile manufacturers.

Funderia Condals' Quality Control department is fitted with a DEA Mistral measuring machine that utilizes the PC-DMIS measurement software. PC-DMIS was installed in 2002, replacing the previous software, Tutor® for Windows.

Josep Manzano, head of the engineering department, comments on PC-DMIS:



"The machine is used for preproduction testing and subsequently for process control. Before PC-DMIS measurement software was used, inspection programs were prepared directly on the machine. This caused the machine to be unavailable for preproduction testing when it was being used to prepare inspection programs. Now that we can build and simulate measurement programs without using the machine, we can devote more time to the real dimensional inspection, thus increasing the level of reliability of our process."

"Off-line programming," Manzano explains, "is performed entirely based on the 3D CAD model of the part. The first test PC-DMIS carries out on the machine is a test of the measuring paths aimed at ensuring that no collisions with the part or the fixturing system occur. It's a safety check which is done as a precaution only, because it is PC-DMIS itself that (without the machine) simu-

lates the measurement cycle and checks any unwanted contacts with the part. Actually, using the off-line programming system of PC-DMIS is like having a second machine - a virtual one, but complete with all functions. When the CAD definition of the part is available, a whole measuring program can be created in 16 to 20 hours. Before having PC-DMIS available, programming time was significantly longer and during that time the machine was not running in production."

But the advantages of PC-DMIS do not end here. Manzano continues:

"When making process checking, it may be necessary to check only a few part characteristics. Since PC-DMIS off-line has a complete measuring program, it allows you to choose, and to execute only some parts of the whole program. In the past, several measuring programs had to be built instead. Moreover, in case of symmetrical parts, you do not need to create the whole measuring program. PC-DMIS itself automatically creates the program for the left side based on the right side and vice versa."

The migration from Tutor for Windows to PC-DMIS was a major step ahead for Funderia Condals, in terms of both results and efficiency. Manzano adds:



"The working method is very similar, so operators did not find any particular difficulty in switching from Tutor to PC-DMIS. The latter, however, is a much more comprehensive and versatile software and offers a lot of automatic functions that make programming easier and quicker." ■



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#### **Hexagon Metrology**

Hexagon Metrology is part of Hexagon Measurement Technologies, a newly formed business area within the Hexagon Group. Hexagon Metrology includes leading metrology brands such as Brown & Sharpe, CE Johansson, CimCore, CogniTens, DEA, Leica Geosystems (Metrology Division), Leitz, PC-DMIS, ROMER, Sheffield and TESA. With an installed base of more than 50,000 CMMs, over 7,500 PCMMs, millions of hand-held instruments and over 30,000 licenses of the popular PC-DMIS metrology software, Hexagon Metrology daily supports its customers to fully control their processes and ensure that what has been designed is in fact manufactured. The company offer of machines, systems and software is completed by a wide range of product support and aftermarket services.

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