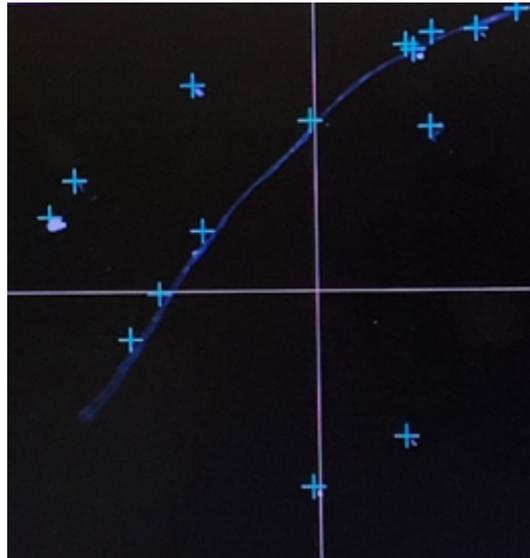




# Aerospace company finds new use for metrology equipment

Video measuring machine doubles as tool for inspecting particulate contamination



Mapping of particulates larger than 10 microns in diameter using Nikon Metrology's AutoMeasure software.

CASE STUDY

Franco-Italian joint venture Thales Alenia Space ([www.thalesgroup.com/en/global/activities/space](http://www.thalesgroup.com/en/global/activities/space)), a major participant in the International Space Station and world leader in the manufacture of military and commercial satellites, recently identified a new, unforeseen application for one pair of Nikon Metrology video measuring machines installed in 2015 at one of its French sites, in Toulouse.

Instead of the former method of monitoring airborne particles in a clean used for a particularly sensitive project room in the firm's Hybrid Methods and Processes Department, methods and procedures technician Cédric Nuytens decided on

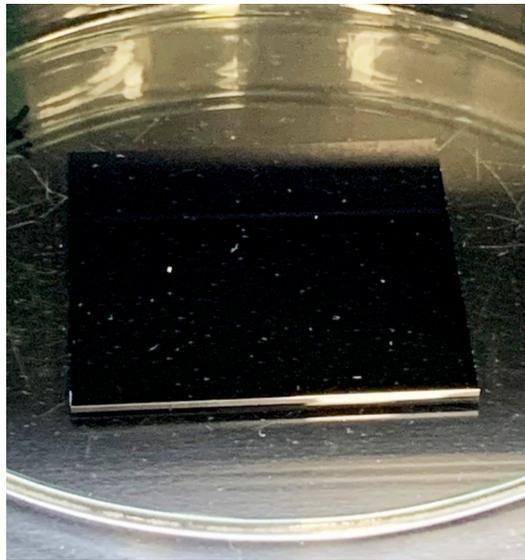
a completely different approach. It was in response to a request from a customer that required a new product to be manufactured containing a silicon CCD (charge-coupled device) sensor whose quality control also required an analysis of micro particulate contamination.

He instigated a new system whereby particles in the clean room are allowed to settle on a black, 25 mm square test sample over the course of one week, after which if particles are more than 10 microns in diameter their number and size are measured. To do this, he used the Nikon Metrology iNEXIV VMA2520 video-based coordinate measuring machine that was originally purchased, among other things, for positional and dimensional control of components as small as 1.0 mm x 0.5 mm and for quality control of printed circuit boards before assembly by measuring the tilt angle of inserted electronic components.

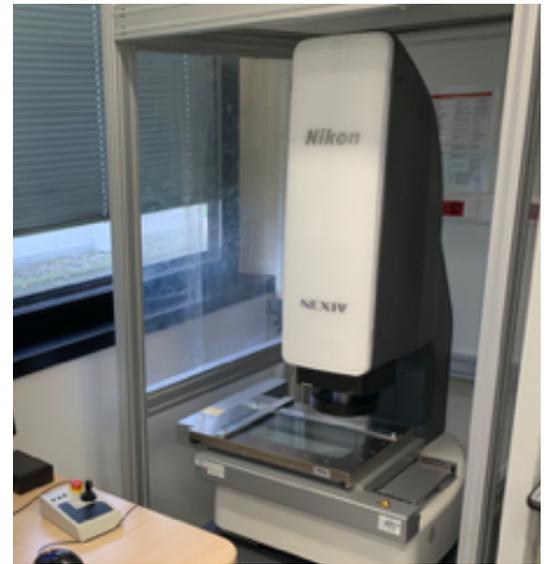
"The instrument is ideal assessing the particulates in the clean room atmosphere. Using a magnification of 534x, it is possible to detect even the smallest of dust particles and measure them."

Cédric Nuytens, methods and procedures technician

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Unwanted particulates on the customer's silicon CCD sensor.



The Nikon Metrology iNEXIV VMZ-R3020 video measuring machine at Thales Alenia Space, Toulouse, is used for new, additional applications - mapping particulates on a particular customer's CCD, at its request, and also within the clean room as a whole.

“The Nikon machine has proved highly satisfactory for both its original applications and the new ones in terms of its speed and precision. We are now fully capable of meeting our customer's new specifications, which was not the case before.”

Cédric Nuytens, methods and procedures technician

Mr Nuytens commented, “The instrument is ideal assessing the particulates in the clean room atmosphere. Using a magnification of 534x, it is possible to detect even the smallest of dust particles and measure them.

The process is assisted by the instrument's LED lighting, which creates shadows and enhances the contrast between the dust and the test sample background to highlight the position and size of the contamination.

We were aware of the quality of Nikon optics used in its cameras and binoculars and we already had a business relationship with Nikon Metrology, so we called on their expertise to implement this application.”

The supplier was able to show how the AutoMeasure software originally supplied with the iNEXIV VMA-2520 - and the larger NEXIV VMR-3020 with a 300 mm x 200 mm stage for measuring larger mechanical and moulded parts as well as high-density circuit boards - could be harnessed for this new application.

Automeasure is a software package that includes interactive measurement and teaching wizards, CAD interface functionality, shape analysis capability, data

management tools and detailed report generation. Nikon Metrology's intuitive CMM-Manager 3.7 inspection software is also employed. Mr Nuytens advised that the interface and programming are user-friendly and that the training provided by the supplier was comprehensive and well delivered.

He concluded, “The Nikon machine has proved highly satisfactory for both its original applications and the new ones in terms of its speed and precision. We are now fully capable of meeting our customer's new specifications, which was not the case before.

“Thanks to the particle mapping capability, not only are we able to execute the customer's stipulated quality control procedure on its CCD but we are now also able to measure particulate contamination in the entire clean room faster and more autonomously, which positively impacts the other work we do.

“What pleased us more perhaps more than anything about the repurposing of the iNEXIV was that it was already in place and we were familiar with its use, so we did not have to spend a lot of time installing and learning a completely new and possibly esoteric inspection system.”