

Optics Manufacturer Invests in a New Cleaning System

HFE Precision Cleaning Takes On a New Dimension

After a total of four years of planning and construction, Europe's largest HFE precision cleaning machine was handed over to its operator in November 2012. A shortage of space on the operator's premises presented a particular challenge during the implementation process.

The new machine, which came into operation in December 2012 at the plant in Oberkochen in Germany belonging to Carl Zeiss Jena GmbH, is used for the interim cleaning of mounting rings to remove oil, grease and dust particles. The machine is fully automatic and meets cleanliness standards for particles of $<5 \mu\text{m}$ in size. The mounting rings, which weigh up to 250 kg, are used to hold lithography lenses in the wafer stepper production process. In order to meet all the operator's requirements, the machine manufacturer Riebesam worked closely with Zeiss and Inventec Performance Chemicals to develop a cleaning concept which provided the necessary flexibility to perform different cleaning tasks. The RC 960 machine will later be used in the final cleaning phase.

The four-bath design covers the following phases of the process: aqueous pre-cleaning with surfactants, aqueous rinsing, interim drying with hot air, precision cleaning with Novec HFE 7100 and rinsing with Novec HFE 7100.

The parts, which are up to 900 x 900 x 250 mm in size, require correspondingly large baths. The two aqueous immersion baths contain 1400 litres of liquid and the two HFE (hydrofluoroether) baths 1200 litres. Despite this, the machine was designed to be as compact and space-saving as possible, because very little room was available at the Zeiss plant. The machine is 8200 mm long, 1800 mm wide and 5480 mm high.

As it weighs a total of 11 tonnes, it was broken down into modules be-



The HFE system on the manufacturer's premises ready for test operation and acceptance by the operator.

fore being transported from Genthin to Oberkochen. When the machine is filled with liquid, its weight rises to 14.5 tonnes, which required some structural modifications on the fifth floor of the building where it was installed. Zeiss has been using an HFE cleaning machine since 1998. "For us, there is nothing to replace the Novec HFE cleaning agent," said Frank Neidhart, head of surface technology at Carl Zeiss in Oberkochen. As a result, Zeiss had already decided that the cleaning agent in its new machine would be the solvent Novec HFE, which is marketed by Inventec. For a period of over 10 years, HFE, which has only a limited impact on the environment, has proved to be a

useful replacement for CFCs in a variety of applications.

The construction of the HFE machine took a total of 4500 hours. At the official handover, everyone involved expressed their satisfaction with the new machine and Frank Neidhart highlighted the outstanding cooperation involving the machine manufacturer and the producer of the cleaning agent. ■

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