

FRAUNHOFER INSTITUTE FOR SILICATE RESEARCH ISC
WÜRZBURG, GERMANY

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100% precision – fast and durable marking of laboratory glassware

Precise calibration and adjustment are essential for high-quality laboratory glassware. For this purpose, the Fraunhofer Institute for Silicate Research ISC provides several semi-automatic devices that work reliably, quickly and mercury-free. The latest calibration device developed by Fraunhofer ISC is the Marking Firing Device (MFD). It allows calibration marks on volumetric flasks to be burned in quickly and reliably without a furnace. The prototype will be presented at ARAB LAB 2019 for the first time.

High-quality laboratory glassware is subject to strict testing standards to ensure the required measurement accuracy for laboratory operation. Each glass vessel – for example a volumetric flask – is individually calibrated by an elaborate process after manufacture in order to be able to precisely apply the marking for the nominal volume. The pistons are filled under precisely defined conditions with the exact quantity of the calibration equipment liquid and the meniscus of the liquid level in the volumetric flask is marked. To get a semi-automatic and time-saving process the CeDeD of the Fraunhofer ISC has developed two devices: AQUAJUST®cam and AUTOJUST®cam.

However, the marking applied individually with enamel colors – whether manually or automatically in the AQUAJUST®cam – still had to be burned in at high temperatures in a furnace in order to be durable. The complete glass flask is heated to the melting temperature of the enamel. The baking process not only requires time and energy, it can also lead to softening of the glass bulb and thus to minor deformation. Under certain circumstances, this can lead to volume changes, so that the previously performed calibration devices of the measuring volume are no longer precise and the volumetric flask must be sorted out after the final quality check.

In order to avoid this process-related waste and to save time and energy, the Marking Firing Device (MFD) has now been developed at Fraunhofer ISC. It heats the volumetric flask only partially at the marked line to the point where the enamel melts and burns in. A high-intensity light source which is precisely aligned to the ring marking, burns in quickly and energy-efficiently. The glass bulb itself is heated only superficially at the marking, therefore, the stability and the volume accuracy are not impaired. The prototype of the MFD will now be presented at the ARAB LAB 2019, Hall S 3, Booth 417.

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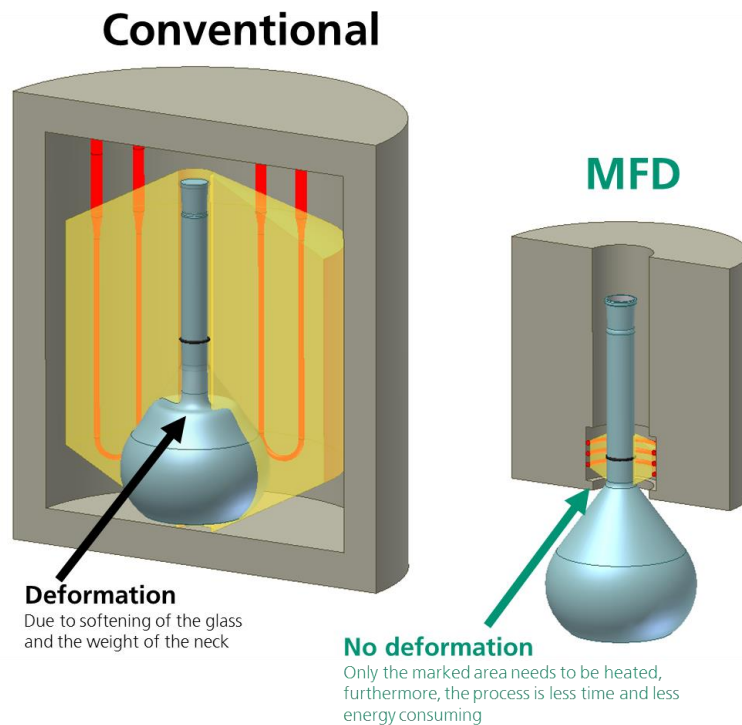


Marking Firing Device (MFD) burns in quickly and reliably calibration marks without deformation © Fraunhofer ISC

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Conventional and MFD processing – MFD is 100% shape sensitive. © Fraunhofer ISC

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The **Fraunhofer Institute for Silicate Research ISC** is one of the leading R&D centers for material-based research and development in the fields of energy, environment and health. With a permanent staff of about 500 scientists and technicians the Institute works to develop innovative materials and technologies for sustainable products and make essential contributions to solving the major global issues and challenges of the future. With its parent Institute and the Translational Center in Würzburg, its Project Group for Materials Recycling and Resource Strategies at Alzenau and Hanau, and its Center for High-Temperature Materials and Design HTL at Bayreuth Fraunhofer ISC combines first-rate expertise in materials science with long-standing experience in materials processing, industrial application and the upscaling of production and process technologies to pilot scale as well as in materials analysis and characterization. With a clear focus on sustainability, the Institute with its project groups is a strong R&D partner for industrial partners.

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