

## EM-Tec MCS-0.1CF replacement for the SIRA calibration standard

Product numbers: #31-C32000-U, #31-C32000-1, #31-C32000-2, #31-C32000-6, #31-C32000-8, #31-C32000-10

### Background information about the discontinued SIRA

The discontinued SIRA calibration specimen was developed in the 1970s and consists of two sets of resin backed cross grating replicas. One of the grating replicas has 19.7 lines/mm and the other one has 2160 lines/mm. They are mounted on standard  $\varnothing$ 12.7mm pin stubs and gold coated. Accuracy of the grating was within 1% on delivery. They have to be re-calibrated after 5-10 years (maximum), which is costly.

### General information about the EM-Tec MCS-0.1CF calibration standard

The EM-Tec MCS-0.1CF magnification calibration standards are manufactured using state of the art MEMS manufacturing techniques. They consist of an ultra-flat Si substrate with deposited chromium and gold features. The features size ranges from 2.5mm down to 100nm on a single ultra-flat compact standard. High contrast 50nm chromium is used for the larger features down to 2.5 $\mu$ m. For the smaller features gold over chromium is used. This ensures excellent signal at all magnifications.

Features sizes on the EM-Tec MCS-0.1CF are:

- 2.5, 1.0, 0.5 and 0.25mm
- 100, 10, 5, 2.5 and 1 $\mu$ m
- 500, 250 and 100nm.

The certified EM-Tec MCS-0.1CF magnification calibration standards are individually calibrated against a NIST measured standard.

### EM-Tec MCS-0.1CF replacement for the discontinued SIRA calibration standard

The EM-Tec MCS-0.1CF is an excellent replacement for the discontinued SIRA calibration standard (which was using 0.51 and 0.463 $\mu$ m features) with additional advantages. The compatible features on the EM-Tec MCS-0.1CF are 50 $\mu$  (5x10 $\mu$ m) and 0.5 $\mu$ m (500nm). Additional advantages for the EM-Tec MCS-0.1CF are:

- All features in a single ultra-flat plane
- Constructed from non-outgassing materials (metal on silicon)
- Excellent signal to noise ratio
- Fully conductive materials
- Compatible with both SE and BSE
- Wider range of features to accurately calibrate low to high magnification ranges
- Can be cleaned with plasma cleaning
- Accuracy 0.7% or better
- Lower cost

### Recalibration

Due to the all metal on silicon construction of the EM-Tec MCS-0.1 calibration standard, the lifetime of this standard is expected to be up to 10 years and beyond in clean systems. A re-calibration service is not offered for this certified calibration standard; individual re-certification is substantially more expensive than a new certified standard. It is more cost effective to purchase a new certified standard.

## TSB 31-C3200 EM-Tec MCS-0.1CF replacement for SIRA calibration standard 2022-05-03 Revision 4

