

FSC1/7: Application Note N35e

Calibration on Metal and Differential Measurement on CFRP



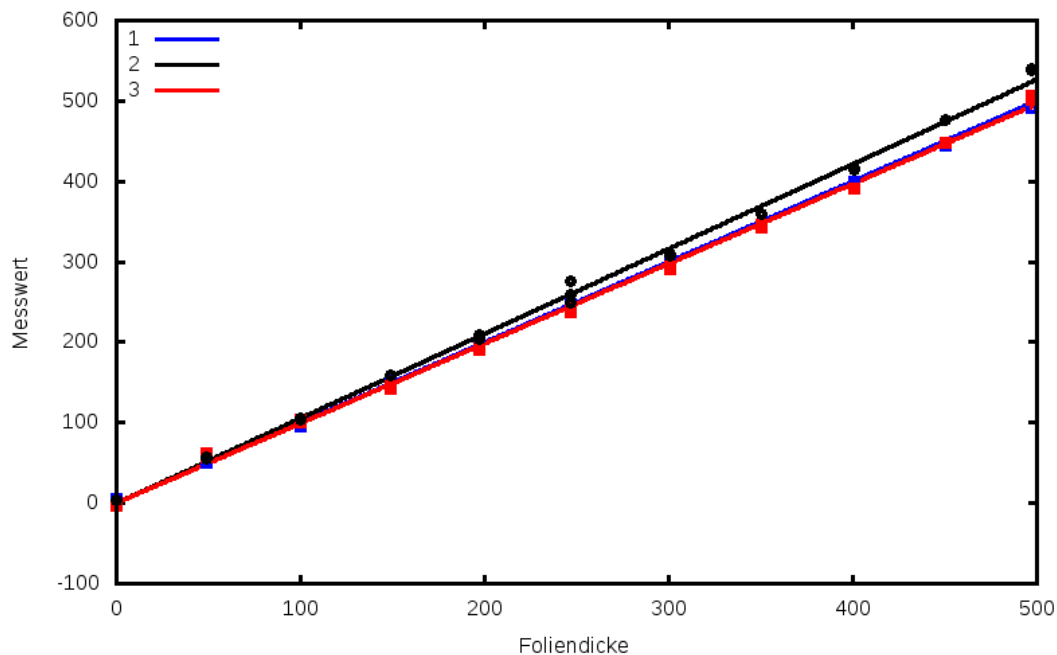
FI Test- und Messtechnik
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The gauge FSC1/7 can be used to measure non-destructively paint thicknesses on CFRP, on CFRP with lightning protection, and on metal. Basically, to do this it has to be calibrated on that kind of material on which the paint thicknesses have to be measured. This presumes the availability of appropriate material samples without or with only thin paint. Sometimes such samples may be not available. For these situations, here an alternative calibration method is shown.

In situations where measurement points are accessible before and after painting it is sufficient to calibrate the instrument on a metal

surface. Then, the measurement differences at the measurement points on CFRP or on CFRP with lightning protection have only small errors.

The figure shows to examples. The FSC1/7 was calibrated on a brass plate using shims of known thickness between 0 μm and 750 μm . Then differential measurements have been performed on aeronautical CFRP and CFRP with lightning protection, respectively. The shown differences are measurement values with shim minus measurement values without shim (basic value).



Messwert: measurement value - Foliendicke: shim thickness

- 1 Measurement on brass calibration sample
- 2 Differential measurement on aeronautical CFRP
- 3 Differential measurement on aeronautical CFRP with lightning protection (expanded copper foil)

It can be seen that the error of the differential measurement values in case of CFRP is less than 5% and in case of CFRP with lightning protection is less than 1%. This shows, that in practice, using “before and after” measurements on CFRP and CFRP with lightning protection no material specific calibration is necessary, but a onetime calibration on metal is sufficient.