

# Central Office of Measures

<https://www.gum.gov.pl/en/about/news/331,Project-ComTraForce-outcomes.html>  
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## Project ComTraForce outcomes

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The project concerns the provision of calibration services in the area of mechanical and material testing in the field of force.



The EMPIR initiative is co-funded by the European Union's Horizon 2020 research and innovation programme and the EMPIR Participating States

In the period from September 1, 2019 to February 28, 2023, the Central Office of Measures participated in the European research project No. 18SIB08 funded by EURAMET under the European Program for Innovation and Research in Metrology (EMPIR) entitled "Comprehensive traceability for force metrology services," with the acronym ComTraForce. The international consortium, coordinated by PTB, involved 13 partners from national metrological institutions (NMIs) and universities.

The main objective of the project was to provide calibration services in the field of mechanical and material testing, using the methods and guidelines necessary to ensure comprehensive measurement traceability in the measurement of static, continuous, and dynamic forces.

The Central Office of Measures participated in the implementation of the tasks of the WP3 work package, the purpose of which was to develop a measurement traceability chain in the measurement of static and continuous forces for metrology services in the field of material testing and other mechanical testing equipment.

The results of GUM's work were published in the following articles:

J. D. Fidelus

[Udział Głównego Urzędu Miar w europejskim projekcie przemysłowym EMPIR w dziedzinie siły](#)

Metrologia i Probiernictwo - Biuletyn Głównego Urzędu Miar, 1(24)/2020, 7-14

J. Fidelus, K. Cybul

[Study on short-term creep effect and hysteresis for the HBM Z4A force transducer under compressive and tensile forces](#)

Acta IMEKO 9 (2020) 5, 137-142 [http://dx.doi.org/10.21014/acta\\_imeko.v9i5.956](http://dx.doi.org/10.21014/acta_imeko.v9i5.956)

J. D. Fidelus, M. Kozuchowski

[GUM's Rockwell hardness standard machines after modernization](#)

Acta IMEKO 9 (2020) 5, 240-246 [http://dx.doi.org/10.21014/acta\\_imeko.v9i5.977](http://dx.doi.org/10.21014/acta_imeko.v9i5.977)

J. D. Fidelus, K. Cybul

Implementation of the EMPIR JRC 18SIB08 'Comprehensive traceability for force metrology services' project at the Central Office of Measures", as a chapter in the Monograph of the Silesian University of Technology J. Roj, Red., Metrologia naukowa, normatywna i przemysłowa : Wybrane zagadnienia, t. 868, s. 78-90, 2020., ISBN 978-83-7880-737-7.

J. D. Fidelus, D. Bejma, A. Prato, A. Germak

[Alignment tilt and force transducer creep effects on hardness in conventional hardness tests,](#)

Proceedings of IMEKO 24th Conference on the Measurement of Force, Mass and Torque (together with the 14th TC5 Conference on the Measurement of Hardness, the 6th TC16 Conference on Pressure and Vacuum Measurement, and the 5th TC22 Conference on Vibration Measurement), 11 - 13 October 2022, Cavtat-Dubrovnik, Croatia, [DOI.: 10.21014/tc5-2022.104](https://doi.org/10.21014/tc5-2022.104)

A summary of the work on the development a force traceability chain for metrological services for static and continuous forces is presented in Deliverable 4.

A. Knott, J. Sander, R. Kumme, F. Tegtmeier, M. Hiti, L. Vavrecka, J. Fidelus, A. Prato, A. Germak, H. Dizdar, B. Aydemir, J. Korhonen, R. S. Oliveira

[Calibration procedure for testing machines to extend the traceability chain from static to continuous forces which can be used for forces in the range of 1 N to 1 MN](#)

Zenado, Deliverable 4, <https://zenodo.org/record/7680252>

The most important output of the project can be found in [Deliverables](#) and [Presentations](#).

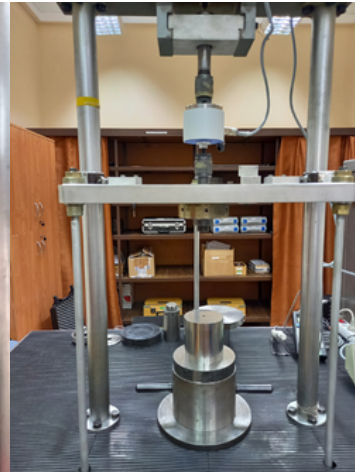
Detailed information on the project and its results can be found on the project website <https://www.ptb.de/empir2019/comtraforce/home/>



Force transducer



Force standard machine up to 500 kN



Force reference standard machine up to 55 kN



Force transducer during calibration



Rockwell hardness standard machine