

BIPM Capacity Building & Knowledge Transfer Programme

2020 BIPM - TÜBİTAK UME Project Placement

REPORT

Project Name	BIPM-TÜBİTAK UME project placements
Description	Hardness metrology and study of the deviations in Brinell indentation measurements and uncertainty calculation
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Motivation & Introduction

This project aims to develop the technical skills and capabilities of the National Calibration and Measurement Center (SASO-NMCC) researchers/technicians in the field of hardness metrology by means of in-house knowledge transfer program. This initiative contains NMIs such as TÜBİTAK UME best practices to be transferred to SASO-NMCC team through technical workshops as well as hands-on training. Worth mentioning that SASO-NMCC participates in interlaboratory comparisons to prove current calibration capabilities with the purpose of submission of CMCs for publication on the BIPM KCDB.

Research

The training program at TUBITAK UME was focusing on three main aspects. The program consists of training on theory behind hardness calibrations, practical implementation of calibrations and uncertainty calculation. Main objectives and activities planned for use and dissemination of knowledge gained during the training are summarized below:

To transfer knowledge gained from the project to colleagues at the National Calibration and Measurements Center (NMCC)

This objective was fully achieved. Theoretical aspects of hardness calibrations, namely calibration of Brinell scale according to the requirements of the ISO 6506 series of standards were explained by mentor during training. The standard consists of three parts:

Part 1: Test method

Part 2: Verification and calibration of testing machines

Part 3: Calibration of reference blocks

Requirements of all three parts of the standard was studied in detail during the training, although many theoretical aspects was left for the future.

Planning and organizing interlaboratory comparisons

The subject and related objectives are of great importance, as being the highest metrological authority in the Kingdom of Saudi Arabia SASO-NMCC is committed to support the development of national quality infrastructure. Planning and organizing of interlaboratory comparisons for private laboratories in Saudi Arabia are very demanding in many metrology fields, and hardness is one of them. Although some activities toward to the objective was realized during the visit, shortness of the visit did not allow to implement the plan in full. It was planned to make some measurement in real indentation with different size of indentation and scale, and further to perform analysis of results. The view of the system to be used for such measurements is presented in Figure 1. But this activity was not executed, but it will be considered for future. An appropriate frame for this activity will be evaluated and chosen.

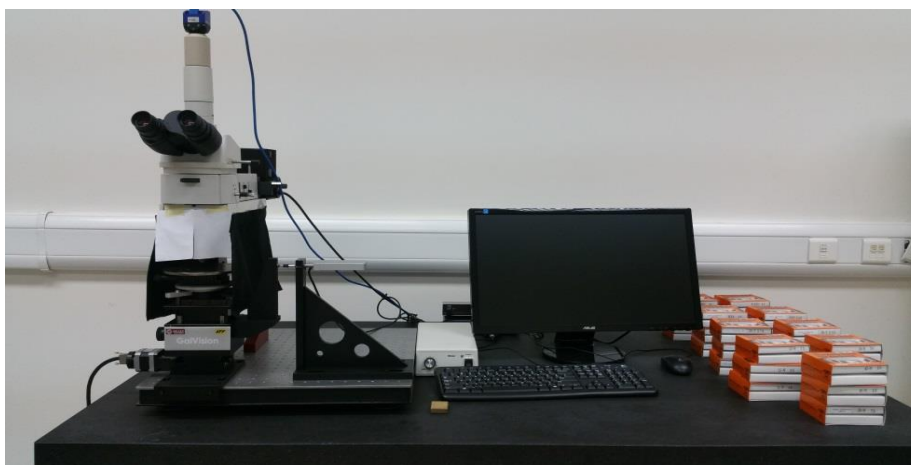


Fig. 1. System for indentation measurement

Conclusions and Future Work

Proposed project aimed to transfer the knowledge and skills gained in mentioned above program to SASO-NMCC team. I was very excited to complete the wonderful program, but under the circumstances, I was not able to complete the project due to the pandemic, and I hope for the near future to complete the project under the umbrella of BIPM - TÜBİTAK UME program or other available frame. Although some of the objectives set before the training was fully met even in the very limited time period, the situation with Covid – 19 prevented realization of the program in full. However, based on the knowledge gained during the short

visit in house knowledge transfer program is being developed to share best practice. Additionally, technical workshops will be conducted as well as on hands training.

Acknowledgements

I would like to take this opportunity to express my thanks and appreciation to TÜBİTAK UME and BIPM staff members for their limitless support and for giving the opportunity to participate in such a beneficial program. Special thanks go to my mentor Mr. Cihan KUZU.