

### Advanced systems for length calibration and surface inspection of end standards

The project responds to the growing need for automation of the process of the length control of gauge blocks (mechanical end standards) which is supervised by Czech metrology institute (CMI). This need is in response to the requirements of manufacturers of precision mechanical engineering, where the main goal is to minimize the cost of production to very low level. The result of the project will be the fully self operating measuring device for mass calibration of the gauge blocks with dimensions up to 100 mm, which will be placed in the workplace of Czech metrology institute (CMI). Thanks to the project, the Czech industrial manufacturers will have the possibility to reliable and fast calibration of the length of gauge blocks, which have to be calibrated periodically on basis of the law. The measuring system will be also included into the international foreign aid program for construction of new metrology institutes, which are now being built in emerging economies.

Code	TA03010663				
State providing funder	Technology Agency of the Czech Republic <a href="https://www.tacr.cz/en/homepage/">https://www.tacr.cz/en/homepage/</a>				
Programme	ALFA Programme(2011-2016) <a href="https://www.tacr.cz/en/alfa-programme/">https://www.tacr.cz/en/alfa-programme/</a>				
Total eligible costs	23 367 000 CZK				
Total project subsidy	15 181 000 CZK				
Subsidy FME TUL	1 296 000 CZK				
TUL project number	17861				
Contractor	Ústav přístrojové techniky AV ČR, v.v.i. Brno <a href="http://www.isibrno.cz/en">http://www.isibrno.cz/en</a>				
Project participants	Český metrologický institut <a href="https://www.cmi.cz/?language=en">https://www.cmi.cz/?language=en</a> MESING, spol. s r.o. <a href="https://www.mesing.cz/?page=domu&amp;lang=en">https://www.mesing.cz/?page=domu&amp;lang=en</a>				
	TUL, Faculty of Mechanical Engineering <a href="http://www.fs.tul.cz/en/">http://www.fs.tul.cz/en/</a>				
Principal investigator TUL	Ing. Štěpánka Dvořáčková, Ph.D.				
Department	Department of Machining and Assembly <a href="http://www.fs.tul.cz/en/technology/machining/research-and-innovations/">http://www.fs.tul.cz/en/technology/machining/research-and-innovations/</a>				
Period	2013-2016				
	<a href="https://www.rvvi.cz/cep?s=rozsirene-vyhledavani&amp;ss=detail&amp;n=0&amp;h=TA03010663">https://www.rvvi.cz/cep?s=rozsirene-vyhledavani&amp;ss=detail&amp;n=0&amp;h=TA03010663</a>				
<b>Costs (year) TUL</b>	2013	2014	2015	2016	Total
Non-Investment (CZK)	0	236 250	325 000	352 000	913 250
Cxl	304 000	78 750	0	0	382 750
Investment (CZK)	0	0	0	0	0
<b>Total (CZK) TUL</b>	304 000	315 000	325 000	352 000	1 296 000
<b>Project results</b>					
2013		<a href="#">RIV/00177016: _____/13:#0000816 - New system for noncontact calibration of gauge blocks (2013)</a>			
2013		<a href="#">RIV/00177016: _____/13:#0000817 - Gauge block calibration by means of the interferometry (2013)</a>			

2013		<a href="#">RIV/00177016: /13:#0000818 - The issue of gauge blocks calibration by interferometry method ? wringing gauge blocks (2013)</a>
2013		<a href="#">RIV/46747885:24210/13:#0004421 - Gauge block calibration by means of the interferometry. (2013)</a>
2013		<a href="#">RIV/46747885:24210/13:#0004472 - New system for noncontact calibration of gauge blocks (2013)</a>
2013		<a href="#">RIV/46747885:24210/13:#0004473 - Gauge block calibration by means of the interferometry (2013)</a>
2013		<a href="#">RIV/46747885:24210/13:#0004474 - The issue of gauge blocks calibration by interferometry method ? wringing gauge blocks (2013)</a>
2014		<a href="#">RIV/46747885:24210/14:#0006658 - Interferometry method for calibration of gauge blocks (2014)</a>
2014		<a href="#">RIV/46747885:24210/14:#0006659 - System for gauge blocks contact?less calibration and 3d diagnostic (2014)</a>
2015		<a href="#">RIV/46747885:24210/15:00002765 - Study of interferometry method for calibration of gauge blocks (2015)</a>
2016		<a href="#">RIV/46747885:24210/16:00001030 - Bezkontaktní systém pro kalibrace koncových měrek (2016)</a>
2016		<a href="#">RIV/46747885:24210/16:00001031 - Rychlé a šetrné měření délky koncových měrek (2016)</a>
2016		<a href="#">RIV/46747885:24210/16:00001031 - Rychlé a šetrné měření délky koncových měrek (2016)</a>
2016		<a href="#">RIV/46747885:24210/16:00003136 - Gauge block calibration by interferometry (2016)</a>
2013		<a href="#">RIV/68081731: /13:00397641 - Active angular alignment of gauge blocks in double-ended interferometers (2013)</a>
2013		<a href="#">RIV/68081731: /13:00398399 - Digital approach to stabilizing optical frequency combs and beat notes of CW lasers (2013)</a>
2013		<a href="#">RIV/68081731: /13:00421280 - Aktivní úhlové polohování koncové měřky v systému pro její automatickou kalibraci (2013)</a>
2013		<a href="#">RIV/68081731: /13:00423136 - Rozbočovač sběrnice CAN s rozhraními USB a Ethernet (2013)</a>
2013		<a href="#">RIV/68081731: /13:00470131 - New system for nanocontact calibration of gauge blocks (2013)</a>
2014		<a href="#">RIV/68081731: /14:00431958 - Interferometric measurement system for cost effective e-beam writer (2014)</a>
2014		<a href="#">RIV/68081731: /14:00434167 - Active angular alignment of gauge block in system for contactless gauge block calibration (2014)</a>
2014		<a href="#">RIV/68081731: /14:00434546 - Detekce středu interferenčního proužku v interferometrii nízké koherence (2014)</a>
2014		<a href="#">RIV/68081731: /14:00434912 - Interferometrický odměřovací systém pro elektronový litograf (2014)</a>
2015		<a href="#">RIV/68081731: /15:00456326 - Active angular alignment of gauge block in double-ended interferometer for its calibration (2015)</a>
2016		<a href="#">RIV/68081731: /16:00464175 - Automatický systém pro kalibraci koncových měrek optimalizovaný pro legální délkovou metrologii (2016)</a>
2016		<a href="#">RIV/68081731: /16:00464175 - Automatický systém pro kalibraci koncových měrek optimalizovaný pro legální délkovou metrologii (2016)</a>
2016		<a href="#">RIV/68081731: /16:00468419 - Sestava pro kalibraci délky koncových měrek (2016)</a>
2016		<a href="#">RIV/68081731: /16:00468421 - Podavač (2016)</a>
2016		<a href="#">RIV/68081731: /16:00468526 - Automatic system for gauge block calibration optimized to meet legal length metrology requirements (2016)</a>
2016		<a href="#">RIV/68081731: /16:00469838 - Systém pro hromadné kalibrace souborů koncových měrek bezkontaktním způsobem (2016)</a>
2016		<a href="#">RIV/68081731: /16:00470129 - Kalibrace koncových měrek bezkontaktní metodou (2016)</a>
2017		<a href="#">RIV/68081731: /17:00480450 - System for automatic gauge block length measurement optimized for secondary length metrology (2017)</a>

2017		<a href="#">RIV/68081731: /17:00482608 - Compact interferometric displacement gauge with sub-nanometer resolution and millimeter range (2017)</a>
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