

EUROMET PROJECT FINAL REPORT		
1. Ref. No.: 740	2. Subject Field: Mass and related quantities (<u>Pressure</u>)	
3. Type of collaboration: Cooperation in research		
4A. Partners: LNE, IMGC-CNR, NMi, PTB, SMU and UME (institutions)	4B. CEC funded? NO	
5. Participating countries: FR, IT, NL, DE, SK, TR		
6. Title: Effective area calculation, uncertainty evaluation and studies for piston-cylinder units of non-ideal geometries used in pressure balances (extended pressure range).		
<p>7. Progress: The derivation of effective area $A_o(p_{atm}, t_{ref})$ of a piston-cylinder used in pressure balances is of high importance representing the largest uncertainty contribution to pressure measurements.</p> <p>The purposes of this projects has been based on:</p> <ul style="list-style-type: none"> - a selection of six piston-cylinder units, with full dimensional characterization of piston and cylinder, intentionally having non ideal conditions of the shape of piston and cylinder and having different diameters for a use in pressure balances from few MPa to 1 GPa full scales in gas and liquid media; - the comparison of the values of $A_o(p_{atm}, t_{ref})$ derived by each participant including the evaluation and comparison of its standard uncertainty $u(A_o)$; - the study of some key points (inlet and outlet cylinder zone where dimensional measurements are difficult to be made, applicability and restriction of the axis-symmetric model, ...). <p>The participants performed calculations following their traditional methods, and a full description of selected units, calculation methods used by participants, analysis of the results have been approved by all participants and are given in [1].</p> <p>A paper [2] will be presented to the 4th CCM International Pressure Conference, London, UK, 19-21 April 2005 and will be submitted for publication to <i>Metrologia</i> (Proceedings of the 4th CCM Pressure Conference).</p>		
<p>[1] G. Molinar et al, Final Report EUROMET Project 740, Calculation of effective area A_o of six piston-cylinder units of pressure balances, File: 740_Final_Report_January_05.doc, 20 January 2005</p> <p>[2] G. Molinar, M. Bergoglio, W. Sabuga, P. Otal, G. Ayyildiz, J. Verbeek and P. Farar, Calculation of effective area A_o of six piston-cylinder units of pressure balances. Results of the EUROMET Project 740, to be submitted to "<i>Metrologia</i>" in the Proceedings of the 4th CCM International Pressure Conference, London, UK, 19-21 April 2005</p>		
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9. Completion date: 04/Mar/2005	10. Coordinator's signature: Gianfranco Molinar	11. Date: 04 March 2005