Activities in EURAMET Technical Committee for Mass and Related Quantities (MRQ)

Zoltan Zelenka
TC-M Chair (BEV, AT)
May 2023
TC-M - Structure

- TC Chair is elected for two years and can be re-elected once. The Chair is supported by the previous TC Chair.
- Subcommittees (SC) within the TC for the corresponding Sub-Fields are established
  - by the Board of Directors with the approval of the General Assembly.
  - A new SC for Gravimetry was established in 2022.
  - A review of all SCs takes place every five years. Based on TC Chair report the Board of Directors approved and renewed the SCs’ activities for the next 5 years in 2023.
- Working groups are established by the TC or its SCs.
TC-MRQ - Structure

TC-Mass:
- Zoltan Zelenka, BEV (AT)

SCs
- Density, Viscosity: Andreia Furtado IPQ (PT);
  24 contacts + 27 experts
- Force: Rolf Kumme, PTB (DE);
  24 contacts + 20 experts
- Gravimetry (new): Alessandro Germak, INRIM (IT);
  11 contacts + 15 experts
- Mass: Stuart Davidson, NPL (UK);
  28 contacts + 24 experts
- Pressure: Wladimir Sabuga, PTB (DE);
  28 contacts + 23 experts

WG
- Strategy Group: Stuart Davidson, NPL (UK);
  8 members + TC chair
- Hardness (new): Alessandro Germak, INRIM (IT);
- Digitalisation (new): Zoltan Zelenka, BEV (AT)

Contacts
- 37

Zoltan Zelenka, EURAMET TC-M Chair, BEV (AT), BIPM-CCM Meeting, 2023
TC-M - Structure

- 29/06/2021: New TC-Chair Zoltán Zelenka (BEV, AT)
- Supported by the previous Chair Fredrik Arrhén (RISE, SE) and
- Members of the Working Group on Strategy
  - Fredrik Arrhén (RISE, SE)
  - Stuart Davidson (NPL, UK)
  - Matej Grum (MIRS, SI)
  - Rolf Kumme (PTB, DE)
  - Isabel Spohr (IPQ, PT)
  - Wladimir Sabuga (PTB, DE)
  - Alessandro Germak (INRIM, IT)
  - Andreia Furtado (IPQ, PT)
TC-M Annual Meetings, 2021

- Online meeting, 97 participants
  - With Subcommittee and Working Group meetings
  - Project meetings
TC-M Annual Meetings, 2022

- Hybrid meeting in Boras
  - With Subcommittee and Working Group meetings
  - Project meetings and EMN workshop
TC-M Annual Meetings, 2022

- Participation

<table>
<thead>
<tr>
<th>Session</th>
<th>Day</th>
<th>Members</th>
<th>In person</th>
<th>Virtually</th>
<th>Comment</th>
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<tbody>
<tr>
<td>WG Strategy closed session</td>
<td>Monday</td>
<td>9</td>
<td>8</td>
<td>0</td>
<td>Closed session</td>
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<tr>
<td>SC Gravity</td>
<td>Tuesday</td>
<td>10</td>
<td>10</td>
<td>15</td>
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<tr>
<td>SC Pressure</td>
<td>Tuesday</td>
<td>28</td>
<td>30</td>
<td>22</td>
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<tr>
<td>SC Force &amp; Torque</td>
<td>Tuesday</td>
<td>23</td>
<td>30</td>
<td>24</td>
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<tr>
<td>SC Mass</td>
<td>Tuesday</td>
<td>27</td>
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<td>36</td>
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<tr>
<td>SC Density</td>
<td>Tuesday</td>
<td>23</td>
<td>20</td>
<td>30</td>
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<tr>
<td>Hardness</td>
<td>Tuesday</td>
<td>-</td>
<td>10</td>
<td>9</td>
<td>Not an official SC or WG (yet)</td>
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<tr>
<td>WG Strategy open session</td>
<td>Wednesday</td>
<td>-</td>
<td>60</td>
<td>33</td>
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<tr>
<td>EMP Workshop</td>
<td>Wednesday</td>
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<td>Open session</td>
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<tr>
<td>Digitalization</td>
<td>Wednesday</td>
<td>-</td>
<td>60</td>
<td>40</td>
<td>Open session</td>
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<tr>
<td>Contact Person Meeting</td>
<td>Thursday</td>
<td>35</td>
<td>49</td>
<td>37</td>
<td>Officially closed session</td>
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</table>
The EMPIR project 17RPT02 “Establishing traceability for liquid density measurements (RhoLiq)” started in May 2018 and finished in April 2022. (Extended)

The EMPIR project 17IND07 “Development of measurement and calibration techniques for dynamic pressures and temperatures” is completed.

The EMPIR project 18SIB04 “Towards quantum-based realisations of the pascal” is in progress. (Delayed)
The EMPIR project 18SIB08 “Comprehensive traceability for force metrology services” is completed. Final report is in progress.

The EMPIR project 19ENG08 “Traceable mechanical and electrical power measurement for efficiency determination of wind turbines” is in progress. (Delayed)

The EMPIR project 19RPT02 “Improvement of the realisation of the mass scale” is in progress.

The EMPIR project 20SIP01 “Developing an ISO Technical Specification ‘Characteristics for a stable ionisation vacuum gauge’” is in progress.
Calibration Guides - updated

- Guidelines on the Uncertainty of Force Measurements
  Version 3.0 (02/2022)
- Guidelines on the Calibration of Electromechanical and Mechanical Manometers
  Version 4.1 (09/2022)
- Guidelines on the Calibration of Automatic Catchweighing Instruments
  Under approval
Calibration Guides – in progress, plans

• No. 3 | Calibration of Pressure Balances, Version 1.0, 03/2011
• No. 14 | Guidelines on the Calibration of Static Torque Measuring Devices
  Version 2.0, 03/2011
• No. 16 | Guidelines on the Estimation of Uncertainty in Hardness Measurements
  Version 2.0, 03/2011
• Under the RhoLiq Project, three new draft guides are planned as EURAMET Guidelines.
• Some other guides planned by EMPIR projects
TC projects

- TC-M is running several projects. Please visit the websites via the links below for detailed information

- [https://www.euramet.org/technical-committees/tc-m/projects](https://www.euramet.org/technical-committees/tc-m/projects)