

***Gulf Association for Metrology***

***GULFMET...***

***Gulfmet Technical Committee for  
Thermometry***

Miltiadis Anagnostou

TC-T Report

CCT November 2020

# Gulmet Member States



- [Kingdom of Bahrain:](#)  
Bahrain Standards and Metrology Directorate ([BSMD](#))
- [State of Kuwait:](#)  
Public Authority for Industry ([PAI](#))
- [Sultanate of Oman:](#)  
Directorate General for Specifications and Measurements ([DGSM](#))
- [State of Qatar:](#)  
Qatar General Organization for Standards and Standardization ([QGOSM](#))
- [Kingdom of Saudi Arabia:](#)  
Directorate General for Specifications and Measurements ([SASO-NMCC](#))
- [United Arab Emirates:](#)  
Emirates Authority for Standardization and Metrology ([ESMA](#))  
Emirates Metrology Institute ([EMI](#)) (appointed on 9<sup>th</sup> of May to be the NMI)
- [Republic of Yemen:](#)  
Yemen Standardization, Metrology and Quality Control Organization ([YSMO](#))

***Gulmet established in June 2010 under the Gulf Standardization Organization (GSO)  
CIPM in its 104 meeting granted provisional acceptance as a RMO in October 2015***

# Gulfmet Associate Members

- [Bosnia and Herzegovina:](#)  
Institute of Metrology of Bosnia and Herzegovina ([IMBIH](#))
- [Egypt:](#)  
National Institute for Standards ([NIS](#))
- [Hong Kong:](#)  
Standards and Calibration Laboratory ([SCL](#))  
Government Laboratory ([GL](#))
- [Korea](#)  
Korea Research Institute of Standards and Science ([KRISS](#))
- [Turkey:](#)  
National Metrology Institute/TÜBİTAK Ulusal Metroloji Enstitüsü ([UME](#))

# TC-T committee



Established on the 22<sup>nd</sup> of November 2015 during the Riyadh (Saudi Arabia) meeting of the joint committee of TC-Length & Therm.

- **TC Chair:** *Dr. Miltiadis Anagnostou, Head of Temperature & Humidity Lab, EMI, UAE*
- **TC Secretary:** *Eng. Ahmed Al Breiki, Senior Metrologist in Temperature & Humidity Lab, EMI, UAE*

# TC-T Gulfmet meetings

Meeting	Date	Place	Participation
1	22/11/15	Riyadh, Saudi Arabia	UAE, SAUDI ARABIA, KOREA, TURKEY
2	24/04/16	Dubai, U.A.E.	UAE, SAUDI ARABIA, TURKEY
3	21/11/16	Dubai, U.A.E.	UAE, QATAR, SAUDI ARABIA, TURKEY
4	16/04/17	Abu Dhabi, U.A.E.	UAE, SAUDI ARABIA, TURKEY
5	12/11/17	Kuwait City, Kuwait	UAE, SAUDI ARABIA, KUWAIT, TURKEY
6	24/04/18	Istanbul, Turkey	UAE, SAUDI ARABIA, KUWAIT, QATAR, TURKEY
7	30/10/18	Kuwait City, Kuwait	UAE, SAUDI ARABIA, QATAR, OMAN, BAHRAIN, KUWAIT, TURKEY
8	22/04/19	Muscat, Oman	UAE, BAHRAIN, SAUDI ARABIA, OMAN, QATAR
9	16/06/20	Web Meeting	UAE, SAUDI ARABIA, OMAN, QATAR, TURKEY
10	06/10/20	Web Meeting	UAE, SAUDI ARABIA, OMAN, QATAR, BAHRAIN, TURKEY

## Main tasks of TC-T

- Thermometry CMCs to be prepared, reviewed and finally published in KCDB 2.0
- Organize interlaboratory comparisons to support these CMCs
- Enhance technical capabilities of the member states through training and research programs.
- Interact with other RMOs TCs and BIPM committees

# Calibration Capabilities of Members



## EMI, UAE

- SPRTs: Hg to Al fixed points
- PRTs: -80 to 660 °C
- Temperature Sensors with Display Unit : -80 to 660 °C
- Block Calibrators: -30 to 660 °C
- Climatic Chambers -40 to 140 °C and 10 to 90%rh
- Air Temperature Sensors: 10 to 70 °C
- Relative Humidity Sensors: 10 to 95 %rh
  
- Thermocouples: -80 to 1100 °C
- Thermocouples at fixed points: Zn, Al, Ag, Cu



# Calibration Capabilities of Members



## SASO NMCC, SAUDI ARABIA



الهيئة السعودية للمواصفات والمقاييس والجودة  
Saudi Standards, Metrology and Quality Org.

- SPRTs: Ar to Ag fixed points
- Thermocouples: -40 to 1200 °C
- Thermocouples at fixed points:  
Sn, Zn, Al, Ag, Cu
- Radiation Thermometers: -50 to 1600 °C
- Relative Humidity Sensors: 10 to 95 %rh



## Calibration Capabilities of Members

### **BSMD, BAHRAIN**

- Digital thermometers: 0 to 60 °C
- Medical thermometers: Contact and IR

### **QGOSM, QATAR**

- Digital thermometers
- PRTs and Thermocouples
- Starting fixed point calibrations (currently at WTP)

# Running Comparisons

Title	Description	Status	Participants	Pilot
EURAMET.T-K7-4	Comparison of Triple Point of Water Cells	Draft A report March 2020 v1 June 2020 v2	UME, EMI, SASO, JNMI (Jordan), IMBIH (Bosnia)	UME
GULFMET.T-K9	SPRT Calibration at Hg, H <sub>2</sub> O, Ga, In, Sn, Zn	Draft A report April 2019	UME, EMI, SASO	UME
GULFMET.T-S1	Relative Humidity Comparison at: 11, 30, 50, 70, 95 %rh and 0, 23, 70 °C	Draft A report October 2019	UME, EMI, SASO	UME
GULFMET.T-S2	Radiation Thermometer Calibration: -20, 0, 50, 100, 200, 400, 600, 800, 1000, 1200, 1400, 1600 °C	Measurements Finished, protocol is pending approval	UME, SASO	UME
GULFMET.T-S3	Platinum Resistance Thermometer Calibration -70 to 250 °C	Measurements finished, Draft A report under prep.	EMI, UME, SASO, QATAR STANDARDS	EMI

# CMCs



- Institutes of UAE and Saudi Arabia are close to submit CMCs, which is not yet done, mainly because all comparisons are in draft A report state.
- According to a recent BIPM/JCRB proposal, Gulfmet members should submit CMCs which will be reviewed in three stages:
  - First internally within Gulfmet using KCDB 2.0
  - Then submitted manually for review in an other selected RMO
  - Finally submit them for the JCRB review using KCDB 2.0

# Gulfmet research and capacity building

- There was a Gulfmet research project run by EMI, UAE between November 2017 and April 2019 with title:

## **“Design, Manufacture, Testing and Distribution of Reference Equipment for Testing Clinical Infra-red (IR) ear Thermometers”**

It was a research and capacity building project, aiming to build the calibration capability facilities required (black bodies) for the calibration of IR ear thermometers.

There were 7 black bodies built that were distributed to the Gulfmet member states during the 8<sup>th</sup> meeting of the committee. Also there were distributed operating instructions of how to use the black bodies for the calibration of IR ear thermometers and uncertainty budget evaluation instructions.

# Interaction with other RMO's and BIPM committees

- TC-T Chair is participating to CCT working group meetings for CMCs, Key Comparisons, and the main CCT meeting
- Gulfmet members (EMI or SASO NMCC) are participating in APMP TC-T meetings in 2017, 2018, 2019 and 2020.

Thank you!

