



1791 Tullie Circle, N.E./Atlanta, GA 30329
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TC/TG/MTG/TRG MINUTES COVER SHEET

(Minutes of all Meetings are to be distributed to all persons listed below within 60 days following the meeting.)

TC/TG/MTG/TRG No. 1.3 DATE June 15, 2021, 4:30-6:30PM ET, LOCATION Virtual

TC/TG/MTG/TRG TITLE Heat Transfer and Fluid Flow

MEMBERS PRESENT	END YEAR	MEMBERS ABSENT	END YEAR	EX-OFFICIO MEMBERS AND ADDITIONAL ATTENDANCE
Kashif Nawaz	2022	Omar Abdelaziz	2024	Will Asher
Michael Wilson	2021	Andreas Knoepfler	2022	Daniel Bacellar
Melanie Derby	2021	Raymond Rite	2024	Ali Behfar YEA
Vikrant Aute	2021	Xiaofei Wang	2023	Sandra Boetcher
Lorenzo Cremaschi	2024			Min Che YEA
Stefan Elbel	2022			Alex Corvino YEA
Brian Fronk	2022			Pratik Deokar
Joseph Huber	2022			Ben Dingel
Satheesh Kulankara	2021			Ahmed Elatar
Stanislav Perencevic	2022			Brian Fricke
				Joe Huber
				Yirong Jiang
				Amir Jokar
				Icksoo Kyung
				Ricardo Lima
				Cheng-Xian (Charlie) Lin
				Josua Meyer
				Achim Gotterbarm
				Gurunarayana Ravi
				Nick Roberts
				Mirza M. Shah
				SA Sherif
				Kishan Padakannaya
				Alex Kuzhippillil Philip
				Minoo Mehdizadeh YEA
				Casey Troxler
				Mike Wilson
				Yang Zou

1. Call to Order (Nawaz)

The meeting was called to order by Chair Nawaz 4:34PM Eastern.

TC 1.3 is concerned with the fundamental principles of the transport of energy, mass, and momentum, especially the study of and application to, physical processes in air conditioning, refrigeration, heating and related areas of environmental engineering.

2. Introduction of members and guests

Attendees announced themselves on Zoom.

3. Establish quorum requirements (Nawaz)

Ten out of fourteen voting members were present, thereby establishing a quorum.

4. ASHRAE Code of Ethics Commitment (Nawaz)

Chair Kashif Nawaz read the ASHRAE Code of Ethics, "In this and all other ASHRAE meetings, we will act with honesty, fairness, courtesy, competence, integrity and respect for others, and we shall avoid all real or perceived conflicts of interests." (See full Code of Ethics: <https://www.ashrae.org/about-ashrae/ashrae-code-of-ethics>.)

5. Review of Agenda (Nawaz)

Chair Nawaz reviewed the agenda.

6. Review/Approve minutes from winter 2021 meeting (Derby)

Members reviewed the minutes from the January 2021 virtual meeting. It was suggested to include end dates for voting members instead of appointed dates.

Pending updating voting member's roll-off dates, the minutes passed, 10-0-4. (*Aute/Perencevic*)

7. Section Head Comments (Leach)

No representatives attended. It was announced that Dustin Meredith will be new section head for Section 1.

8. Liaison Comments

No liaisons attended.

9. Membership Subcommittee (Gotterbarm)

As of July 1, voting members rolling off TC 1.3 include Wilson, Derby, Kulankara, Aute. New members to roll on include Ieksoo Kyung and Pratik Deokar. After July 1, TC 1.3 will have an appropriate balance, with seven academics and five industry representatives.

10. Handbook Subcommittee (Ravi)

The 2021 Handbook was successfully published and Subcommittee Chair Ravi thanks all who helped with revisions. Ravi is currently working with Dr. Shah on the next cycle's revision. TC 1.3 is responsible for chapters 3, 4, 5, 6, and 33. As a goal, the Handbook Subcommittee would

like a preliminary list of ideas and chapters for modification by January 2022, with a preference for adding peer-reviewed sources. Ravi encouraged TC 1.3 attendees to contact him if you would like to join the revision team (gurunarayana.ravi@lennoxind.com).

11. Program Subcommittee (Deokar)

Program Subcommittee Chair Deokar gave an overview of TC 1.3 programs given at the 2021 June Virtual meeting, and compiled suggestions for sessions for the Las Vegas meeting.

12. Status of other current/proposed programs (Pratik Deokar)

TC 1.3 sponsored two seminars in the 2021 Winter Virtual Conference: Seminar 25: Movement and Control of Airborne Pathogens with HVAC Systems and Seminar 34: Performance of Alternative Low GWP A2L Refrigerants in Condensers.

Four on demand sessions were selected for the 2021 Annual Virtual Conference: Seminar 58 Performance of Alternative Low GWP A2L Refrigerants in Evaporators, Seminar 59 Performance of Low GWP Refrigerants in Plate Heat Exchangers, Seminar 42 Experimental Study on the Effect of Enhanced Tube Characteristics on Fouling Behavior and Fouling Prediction Model, and Seminar 23 Additive Manufacturing of Heat Exchangers: Performance, Challenges and Opportunities (Research Summit, June 30).

The committee expressed gratitude to Deokar for the many successful seminar submissions.

The program deadline for the 2021 Las Vegas Winter Conference is August 2, 2021. Deokar is organizing a seminar tentatively titled, “Thermal and hydraulic performance of nonazeotropic, low GWP under flow boiling and condensation.” Volunteers to present include Melanie Derby, Simone Mancin, Kashif Nawaz, and Lorenzo Cremaschi.

TC 1.3 approved the Las Vegas seminar sponsorship with a vote of 9-0-5 (*Aute/Perencevic*)

Dr. Shah discussed the importance of data from nonazeotropic mixtures and refrigerant performance with oil. Joe Huber suggested there is also demand for new, low GWP pure refrigerant data and confirmation of existing correlations. The TC agreed these may be salient topics for future seminars

TC 1.3 voted to cosponsor a seminar sponsored by TC 8.5 for Las Vegas entitled, “Additively manufactured heat exchanger (liq-to-ref).”

The motion passed with a vote of 8-1-5, (*Derby/Fronk*)

There was discussion of a seminar proposal by MTG ACR Dr. Kishor Khankari entitled, “Transmission of Aerosols in Dental Treatment Rooms.” The TC requested more information about the seminar, including whether presentations are experimental or CFD. The TC will vote via e-ballot.

13. Webmaster (Elatar)

Webmaster Elatar is currently serving, but has a time conflict with TC 1.3 when meetings return onsite. Deokar volunteered to be an alternate webmaster.

14. MTG Liaison: Low GWP Refrigerants (Kulankara)

Liaison Kulankara noted two seminars sponsored by the MTG at current meeting and gave an update on active research projects RP-1806 Flammable Refrigerants Post-Ignition Simulation and Risk Assessment Update, RP-1855 Determination of the Impact of Combustion Byproducts on the Safe Use of Flammable Fluorinated Refrigerants, and RP-1884 The incorporation of odorants in refrigerants to improve leak detection –Phase II experimental study.

15. Research (Huber)

Joe Huber presented slides for a research update. The Society research meeting will be held in July/August. There is currently no funding for new projects, although this hopefully will change after the upcoming AHRI show. There is a queue of approved projects to work through once funding is available.

TC 1.3 had a research review meeting on 6/14.

RP-1683 Experimental Evaluation of Two-Phase Pressure Drop and Flow in U-Bends with Ammonia completed its literature review and started construction of its test facility. After some delays due to Covid-19, it is anticipated the experimental facility will be completed by October.

RP-1800 Spray Evaporation on Enhanced Tube Bundles with Low GWP pure Refrigerants and Refrigerant/Miscible Oil Mixture project is underway with a completed literature review. The test facility construction was delayed by Covid-19, but the contractors are currently acquiring data.

Huber thanked Rite and Padakannaya for their work on RTAR 1909, which was submitted to RAC and co-sponsored by TC 6.3.

There was further discussion of possible RTARs. Vikrant Aute discussed potential co-sponsorship of an RTAR mentioned in TC 8.5 regarding characterization of condensation heat transfer in fluted tubes. Condensation and evaporation of low GWP refrigerants in microchannels was a possible research topic discussed at a previous meeting. It was suggested to consider non-azeotropic mixtures. Aute volunteered to assist on evaporation, but TC 1.3 is looking for a leader for this RTAR. Other topics discussed included a literature review and recommendations for the effects of oil on heat transfer.

16. Chair Comments (Nawaz)

Nawaz shared updates from the Chair's breakfast. Section 1 Head Dustin Meredith will follow up with TC 1.3 in person in Las Vegas. The June 2021 Annual Meeting schedule is available on the ASHRAE portal. ASHRAE noted five approved mergers approved by TAC.

For the 2020-2021 cycle, there were six nominations for the George B Hightower award. Next cycle's nominations are due on September 1, 2021. Nawaz also discussed ASHRAE's strategic plan.

17. New Business

No new business was discussed.

18. Next meeting: TBD

Chair Nawaz mentioned that it is hopeful for in person Las Vegas meeting, and will distribute the meeting date once it is selected.

19. Adjourn

TC 1.3 adjourned at 6:24 PM Eastern, 9-0-5. (*Huber/Kulankara*)