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Committee E55
Manufacture of Pharmaceutical and Biopharmaceutical Products

NEWSLETTER

Introduction

E55 Newsletter

E55 on Manufacture of Pharmaceutical and Biopharmaceutical Products

Chair: Ferdinando Aspesi, Bridge Associates International
Vice-chair: Russell Madsen, The Williamsburg Group, LLC

Welcome to the latest edition of the ASTM Committee E55 Newsletter, where plenty of new and interesting things are happening committee-wide.

This edition of the newsletter comes following great success and positive feedback of the fall committee meeting at Purdue University in October. This was held in conjunction with a one-day workshop on Lyophilization hosted by LyoHub, with special thanks to Arnab Ganguly, Jennifer Gray, and everyone involved for their support. Topics of the event centered around the ongoing work of subcommittee E55.05, with detailed updates provided herein.

Forward thinking continues with the release of a new Roadmap Brochure which describes the evolution and future of standards within E55. This new awareness piece is a useful tool for providing information to prospective and current members of the important work E55 has accomplish and what is yet to be achieved.

The committee welcomes two new academic members to the mix: Carl Lawton of the Massachusetts Biomanufacturing Center at UMass Lowell and Alastair Florence of the Future Continuous Manufacturing and Advanced Crystallisation (CMAC) Research Hub in Glasgow, UK. Both will serve as members of the E55 Executive Subcommittee and provide an academic prospective to the committee.

And please mark your calendar on April 9-11, 2019 for the next E55 meeting and workshop to be hosted by Sartorius in Göttingen, Germany, the university town once home to Carl Friedrich Gauss, the famous 18th century mathematician. More information will be provided under Upcoming Events.

As always, everyone is invited to contact the E55 ASTM Staff Manager, Travis Murdock with any questions of other feedback for the Newsletter.

Subcommittee Reports

Path to Success

Under the direction of the Executive Subcommittee and the input of our members, E55 continues to make significant progress towards revising and expanding its catalog of international standards. This section covers Subcommittee reports highlighting the accomplishments and ongoing efforts in standards development. All members and interested industry stakeholders are encouraged to contribute to any of these efforts by reaching out to the Subcommittee chairmen.

E55.01 Process Understanding and PAT System Management, Implementation and Practice

Chair: Martin Warman, Martin Warman Consultancy Ltd

Since the previous issue of the newsletter, E55.01 has completed one new standard and has another revision following suit. Formerly under development as **WK64140**, new standard **E3177-18** *Standard Guide on Sampling for Process Analytical Technology* was recently approved and is now available on the ASTM website. Attention has is now focused on the approval of revision of **E2891-13** *Standard Guide for Multivariate Data Analysis in Pharmaceutical Development and Manufacturing Applications.* Under **WK61701**, the revision has been approved by the subcommittee and will be sent out for main committee approval before the end of the year.

Other E55.01 standards still going through the resolution process after receiving negative votes during balloting include **WK57018**, revision of **E2629-11** *Standard Guide for*

Verification of Process Analytical Technology (PAT) Enabled Control Systems and **WK51471**, revision of **E2968-14** *Standard Guide for Application of Continuous Processing in the Pharmaceutical Industry*. The group also plans to revise **E2898-14** *Standard Guide for Risk-Based Validation of Analytical Methods for PAT Applications* under the new work item **WK64892**. Each of these items were discussed during the E55.01 subcommittee portion of the October E55 meeting at Purdue University and are expected to go out to ballot in early 2019.

In response to interest from members, the subcommittee also has plans to launch the development of three new standards on good manufacturing practice (GMP) in pharmaceutical manufacturing. The topics include developing standard guides for GMP implementation of soft sensor/method validation, Advanced Process Control (APC), and machine learning. Further information on this new activity along with an invite to participate on the task group will be distributed once the scope of work is defined and approved.

E55.03 General Pharmaceutical Standards

Chair: Claus Weisemann, Dynavax

Soon after the completion of Subcommittee E55.03's newest standard earlier this year, subsequent technical and editorial revisions to **E3106-18e1** *Standard Guide for Science-Based and Risk-Based Cleaning Process Development and Validation* based on comments from the U.S. Food and Drug Administration (FDA) have been approved and incorporated into the standard. Thanks to the hard work of Andrew Walsh and the E55.03 cleaning task group, the approval of E3106 has set the stage for two additional proposed standard: **WK59975** *New Standard Guide for the Derivation of Health Based Exposure Limits (HBELs)* will be sent out for its initial subcommittee ballot by the end of the year; and **WK64938** *New Practice for the Calculation of Cleaning Validation Limits* is currently under development.

Additional ongoing projects within E55.03 include an update of the committee's most popular standard **E2500-13** *Standard Guide for Specification, Design, and Verification of Pharmaceutical and Biopharmaceutical Manufacturing Systems and Equipment* and completion of a draft for **WK52609** *Standard Practice for Validating End-user Sterilizing Filtration of Pharmaceutical, Biopharmaceutical, and Biological Products*, both of which are anticipated to move on to balloting in the coming months.

E55.04 General Biopharmaceutical Standards

Chair: Bob Steininger, Surface Oncology

Subcommittee E55.04 has been in overdrive since headlining the April 2018 workshop at the Amgen facility in Cambridge, Massachusetts, which triggered a surge of new projects and participation on a variety of topics.

One of the leading topics of interest under E55.04 has been standards for single-use systems, which currently has three active task groups drafting new standards. These proposals include: **WK63260** *New Practice for the Extraction of Particulate Matter from Single-Use Systems used in Biopharmaceutical Manufacturing*; **WK64337** *New Practice for Integrity Assurance and Testing of Single-Use Systems*; and **WK64975** *New Test Method for Microbial Ingress Testing on Single-Use Systems*. Each of these items are currently in various stages of development and are expected to go out for ballot throughout 2019.

Another area of interest is on biotherapeutic process related standards. Recently opened work items include: **WK65429** *New Practice for the Process to Remove Retrovirus by a Small Virus Retentive Filter*; and **WK64991** *New Practice for Stability of Biotherapeutics Products at Less Than or Equal to -65° C*. The subcommittee is confident development of these two items will move quickly and estimate balloting in early 2019. Additional work on this topic are plans to develop a new standard on a biotechnology-based process using the existing E55.01 standard **E2968** as a foundation.

Other new areas E55.04 is actively exploring for potential standardization are management of downstream bioburden, particularly in fill and finish applications as well as applying and adapting relevant existing biotherapeutic standards for gene and cell therapy processes.

E55.05 Lyophilization

Chair: Arnab Ganguly, IMA Life

Subcommittee E55.05, the first of two new subcommittees established this year, has been moving fast on its mission

to convert the guidance documents developed within the LyoHub group into new E55 standards for industry. The first order of business for the subcommittee has been the development of **WK63507** *New Practices for Process Monitoring Instrumentation in Pharmaceutical Freeze Drying*, which was the primary item of discussion during the October 2018 meeting at Purdue University. The fruitful review and debate over the content of the draft standard came on the heels of the highly successful LyoHub/ASTM joint workshop on Lyophilization and Future of Pharmaceutical Manufacturing. With the draft in the final stages of task group review, the subcommittee plans to send **WK63507** out for its first round of balloting in early 2019. Anyone who is interested in contributed to this activity is encouraged to join the subcommittee and participate.

E55.06 Microbial/Sterility Assurance for Pharmaceutical and Biopharmaceutical Products

Chair: Dieter Bachmann, Johnson & Johnson

As the second of the two new subcommittees established in 2018, E55.06 held its inaugural meeting along with the rest of the committee at Purdue University in October. While still in the earlier stages of formation, subchair Dieter Bachmann provided an overview of the scope for the new group and facilitated a discussion of topics for consideration as new standards. These potential topics included: Pre-Use Post-Sterilization filter integrity testing (PUPSIT); Contamination Control strategies; Release Testing Strategy, i.e., Parametric or RTRT; SUS, Leak Testing Post Use; Integrity testing; and Garment controls and Gowning practices. The new subcommittee plans to liaise with existing E55 subcommittees and other relevant ASTM technical committees as well as connect with external groups such as ISO TC 198 WG9, USP, PDA, and ISPE.

Standards Roadmap

New Roadmap Brochure

E55.95 Roadmap for Standards Development

Chair: Louis Traglia, Commissioning Agents Inc.

Leading up to the October 2018 meeting, the E55.95 subcommittee successfully published a new E55 Roadmap brochure. Designed to help generate industry awareness and subject matter expert interest in the various E55 task groups, this new piece highlights the origins of E55, showcases committee accomplishments to date, and provides a summary of topics for future consideration. These topics of future consideration for standardization include the expansion of Single Use Technology into subjects like aseptic filling and other components as well as areas of importance within lyophilization and microbial and sterility assurance, which led to recent formation of E55.05 and E55.06 respectively. Furthermore, the growth of gene therapies as well as vector-based therapies are just two additional areas the E55 is exploring. An electronic copy of the Roadmap brochure can be found on the E55 homepage, under the Additional Information section.

The subcommittee is now turning its attention to developing additional resources for both members and non-members designed to help categorize all current and draft E55 standards, with special attention given to the use of descriptive keywords linked to the content of the documents.

Committee Outreach

Reaching the Global Community

E55.05 Headlines Lyophilization Workshop

Thanks to the overwhelming engagement from the members of E55.05 and our colleagues at LyoHub, the Committee was invited to convene the fall 2018 meeting at Purdue University. The event took place over October 23-25, beginning with a joint LyoHub/ASTM E55 workshop on

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Lyophilization and Pharmaceutical Manufacturing Research. The workshop included presentations focused on the fundamentals, current best practices, advances in regulatory science, emerging technologies, approaches to biopharmaceuticals, and future industry perspective of lyophilization. Presenters at the workshop represented a wide range of industry stakeholders consisting of LyoHub staff and members, Purdue University faculty, FDA, Baxter, IMA Life, Pfizer, AbbVie, NIIMBL, and more. Attendees also included university students, ASTM E55 members, and other interested organization representatives.

Immediately following the workshop, attendees were invited to a student poster session at the Birck Nanotechnology center as well as a tour of the LyoHub demonstration lab. The day concluded with a networking dinner at the John Purdue Room in Marriott Hall, where awards were presented to the winners of the poster session. General feedback from on event was very positive and helped stimulate the E55 Committee meetings that followed, which were held at the Indiana Manufacturing Institute.

Credit for the success of the October 2018 workshop and meeting goes to our colleagues at LyoHub and Purdue University, with specials thanks to E55.05 subcommittee chairman, Arnab Ganguly, and to LyoHub staff liaison, Jennifer Gray.

Upcoming Events
Future Meetings

Save the Date: April 2019 E55 Meeting and Workshop

The next face-to-face meeting of E55 will be held on April 9-11, 2019 in Göttingen, Germany. Courtesy of fellow members at Sartorius, the committee will meet at the Sartorius College facility. Plans are in the works for a first day workshop followed by a facility tour and two days of subcommittee and task group meetings. The theme for the workshop will be on single-use systems, touching on topics such as: particulates and characterization; quantity assessment; integrity and sterility of equipment; bioburden load; continuous processing; biocompatibility; filter testing; pre-use post-sterilization integrity testing (PUPSIT); and EU regulatory expectations with respect to draft requirements for sterile medicinal products. Anyone with expertise in SUS is invited to contact Marc Hogreve (Marc.Hogreve@Sartorius-Stedim.com).

This event is open all E55 members as well as non-members. Additional information will be posted to the ASTM E55 website and distributed to members as soon as it is available.

E55 added to 2020 International Committee Meeting

Committee E55 recently joined forces with 3 other ASTM technical committees to participate in a combined international meeting in Prague, Czech Republic during the week of April 26, 2020. While each group will meet individually, the goal is to provide a single venue for meetings along with additional ASTM member resources and training commonly found at Committee Weeks to committees that frequently meet independently in Europe. Committee E55 convene its meetings in conjunction with F02 on Primary Barrier Packaging; F44 on General Aviation Aircraft; G04 on Compatibility and Sensitivity of Materials in Oxygen Enriched Atmospheres. Additional information regarding this meeting will be distributed as it is made available.

Call for Meeting Locations or Events

As a technical committee that meets outside of the traditional ASTM Committee Week schedule, E55 routinely relies on committee members and industry partners for support in identifying future meeting locations. If you are interested, or aware of an organization, that would like to host a future E55 committee meeting or special event, we encourage you to contact Travis Murdock (ASTM Staff Manager, Technical Committee E55; tmurdock@astm.org) to discuss meeting logistics and requirements.

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Membership Updates

Colleagues in Industry

E55 Leadership Expands into Academia

The E55.90 Executive Subcommittee is proud to announce two new academic members to the committee; Dr. Carl Lawton of the Massachusetts Biomanufacturing Center at UMass Lowell and Dr. Alastair Florence of the Future Continuous Manufacturing and Advanced Crystallisation (CMAC) Research Hub in Glasgow, UK.

Dr. Carl W. Lawton is director of the Massachusetts BioManufacturing Center (MBMC) and Associate Professor in the Department of Chemical Engineering at University of Massachusetts Lowell. As director of the MBMC, Dr. Lawton oversees the coordination and completion of process development client services including expression development, fermentation and cell culture development, downstream processing, process optimization and characterization. Dr. Lawton works closely with companies on the verge of biopharmaceutical production to give them the opportunity to utilize the Center's services to economically address staffing needs and learning curve constraints and to optimize time to market. He also is responsible for developing and maintaining an applied research program which focuses on technological advances to improve the quality, cost and productivity of large-scale biomanufacturing production.

Dr. Lawton holds a B.S. in Microbiology from Purdue University and an M.S. in Microbiology from University of Connecticut. He earned his M.S. and Ph.D. in Chemical Engineering at University of Connecticut. Before joining UMass Lowell and creating the MBMC, Dr. Lawton was a bioengineering process consultant.

Professor Alastair Florence is Director of the EPSRC Future Manufacturing Research Hub in Continuous Manufacturing and Advanced Crystallisation (CMAC), leading the multidisciplinary academic team as well as partnerships with NPL and leading international groups through I2APM. He is PI on the associated CMAC Doctoral Training Centre that has to date recruited over 50 PhDs across the collaborative academic network and he also leads the new world-class CMAC National Facility within the Technology and Innovation Centre (TIC) at Strathclyde. The facility offers access for academic and industrial users to state-of-the art processing, analysis and characterization facilities. His research interests lie in the science and technology associated with continuous crystallization, physical form control and advanced characterization of pharmaceuticals. This spans polymorphism, solvate, co-crystal and salt formation and structural investigations of amorphous systems. Alastair has extensive experience in the formation of pharmaceutical particles in continuous processes using a range of technologies as part of the CMAC program.

Both Dr. Lawton and Prof. Florence will serve on the Executive Subcommittee and help provide an academic perspective to the ongoing and future work of E55. Please join us in welcoming them to the committee.

Welcome New E55 Members

For those just joining the Committee – Welcome! Your participation in the technical committee allows you to directly impact the content of the standards. The following list of new members includes those who joined E55 since the previous issue of the E55 Newsletter.

New Member	Organization
Bansa, Patrice	Oetiker Ltd.
Basile, Ralph	Healthmark Industries Co
Bogner, Robin	
Bombonato, Rafael	Gironatto
Ciesiolka, Joshua	Performance Validation
Florence, Alastair	CMAC
Goh, Leong	
Gray, Jennifer	Purdue University/LyoHub
Irizarry-Martinez, Jonatan	Global NEP, LLC
Kolodziejski, Michelle	Eurofins Lancaster Laboratories
Kopec, Daniel	Sartorius Stedim
Langlois, Carole	Sartorius Stedim Biotech

Lawton, Carl	UMass Amherst
Liesum, Lorenz	Novartis
Morris, Tina	Parenteral Drug Association
Nikolic, Sasha	Laboratorio Reig Jofre
Nishiura, Takeshi	
Raye, Charles	EMD Millipore
Thomas, Colleen	US Food and Drug Administration

The current E55 membership consists of over 180 subject matter experts from around the world. Countries represented include: Austria; Belgium; Canada, China; Denmark; France; Germany; Ireland; Jamaica; Japan; Mexico; Nepal; New Zealand; Peru; Singapore; Spain; Sweden; Switzerland; UK; USA.

Not a Member? Here's How to Get Involved

Any individual or organization from any country with interests in the pharmaceutical and biopharmaceutical industry are welcome to join Committee E55 and share your ideas. Existing ASTM International members can join E55 via their MyASTM account page. If you are not already an ASTM member, all you need to do is complete an application at www.astm.org/MEMBERSHIP/. Should you ever have any questions regarding the organization, the Committee, or standards in general, do not hesitate to contact our E55 Staff Manager, Travis Murdock, at tmurdock@astm.org.

Effective Participation Tips

Maximize Your Investment

Proactive Participation

After joining your committee(s), we encourage you to be proactive – build a foundation of knowledge and engage with the committee leadership. Here is some key information to get you started.

ASTM Member Training

We offer live online training year-round, as well as face-to-face training at most technical committee meetings. The sessions provide information on navigating our website and the standards development process and include situational questions and solutions. We recommend participation in the New Member Orientation and Balloting and Handling Negatives Votes sessions.

View member training topics and upcoming sessions at www.astm.org/MEMBER_TRAINING

Voting

E55 members with official voting rights are encouraged to vote on all ballot items in order to maintain their voting rights and to help the item meet the necessary response requirements, per ASTM regulations. For voters who are not familiar with an item can vote abstain to help the item move forward in the approval process. If you have any questions about an item on ballot, you can always contact the technical contact of the item or the E55 Staff Manager.

Meetings

Attendance at ASTM committee meetings is not required; however, it is one of the most effective ways to engage the process and can network with industry colleagues. Most committees meet face-to-face twice per year, hold teleconferences and communicate via email throughout the year. These are the forums at which decisions are made. Scheduled committee meetings are listed on our website. They are free to attend, and online preregistration is available.

Who's Who?

All ASTM committees have a Committee Chairman (elected), Staff Manager, and Administrative Assistant who act as resources for any questions you may have. Introduce yourself to the Chairman and the Manager at a meeting, by phone, or email.

Additional Information

Other Tools: ASTM Regulations
ASTM Form & Style Manual
How Standards Get Developed