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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 Fall 2021 edition of the ASTM Committee E55 Newsletter.

This issue follows the recent Fall 2021 meeting of E55, which was held virtually on October 13 and 14. This issue of the Newsletter contains updates and details on new activities of the Committee which have occurred since our last meeting in April 2021.

In the past few months, the committee has carried out multiple initiatives to reach out to our Stakeholders. The following is a collection of recent activities and accomplishments:

- E55 leadership held the second ASTM E55 Industry Forum on May 14, 2021, which has identified three areas that are currently important to the industry. New topics for standards development were explored, including aspects of Media Fills, Aseptic Manufacturing and Sterility Assurance in Cell and Gene Therapy Manufacturing, which is now being run by a team within the Subcommittee E55.06 and two meetings have been held.
- Committee leaders hosted another meeting of the ASTM E55 Academia Forum on October 6th, 2021. This was the 5th meeting of this group since it was formed in 2019. There were three presentations from Academia Professors which were identified as areas for potential consensus Standards.
  - Prof. Alastair Florence from the University of Strathclyde (Scotland) presented on *the mission and areas of work for Data Driven Medicine Manufacturing Center (DDMMC) & Digital Design and Manufacturing Amorphous Pharmaceuticals (DDMAP)*
  - Carl W. Lawton, the Director of Massachusetts Manufacturing Center at the University of Massachusetts Lowell (US) presented on *Cell & Gene Therapy Manufacturing Platforms and mRNA Continuous Manufacturing*
  - Prof. Matteo Crea from the University of Milan Institute of Pharmaceutical Technology (Italy) presented on *Oral Drug Delivery: Prolonged, Pulse and Site Release -3D and 4D capsule printing*
- As part of the E55's European Strategy, connections have been established with the Italian Pharmacist Association (AFI) as well as the UK Center for Process Analytics and Control Technology (CPACT). To date, E55 members have presented two Webinars on ASTM E55 and on the Standards we are currently working on to their respective audiences. As part of the same initiative, E55.04 sub-chair, Jeff Carter presented on E55 committee efforts at the ISPE Biotechnology Conference this past September.
- Efforts to establish similar relationships with colleagues in Swiss Academia and in the Irish Pharmaceutical Industry are also underway.

Finally, we also want to let you know that our term as ASTM E55 Committee Chair and Vice chair will be over as of December 31, 2021. Starting on January 1, 2022 the recently elected Chair: John Logar (J&J) and Vice Chair: Don Kientzler (Jetstar Research) will take over, and the position of Committee Secretary will transition from Rick Van Doel to Jennifer Gray (Purdue University). We want to thank all of the ASTM E55 members for your great contributions to the success of ASTM E55 during our chairmanship and wish to John, Don, and Jennifer great results for ASTM E55 and its members.

As we look to the new year, please be sure to mark your calendar for the next E55 Meeting currently scheduled for 20-21 April 2022. Our hope is return to meeting in-person

at the ASTM Headquarters in West Conshohocken, PA (USA).

And as always, everyone is invited to contact the E55 ASTM Staff Manger, Travis Murdock (tmurdock@astm.org) with any questions or feedback on the Newsletter.

Subcommittee Reports

Path to Success

Under the direction of the Executive Subcommittee and through 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 chairs.

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

Chair: Benoît Igne, Vertex Pharmaceuticals

The E55.01 subcommittee activities have focused on addressing negative ballot comments to **E2968-14** *Standard Guide for Application of Continuous Processing in the Pharmaceutical Industry*, **E2475-10(2016)** *Guide for Process Understanding Related to Pharmaceutical Manufacture and Control*, and **E2476-16** *Guide for Risk Assessment and Risk Control as it Impacts the Design, Development, and Operation of PAT Processes for Pharmaceutical Manufacture*.

WK76297 *Proposed Standard Guide on Advanced Process Control (APC)* to develop a new standard on the use of Advanced Process Control in the pharmaceutical industry is progressing. The authoring team will share a draft for review in December 2021; A second draft for **WK74957** *Proposed Standard Guide PAT System Applications in Biopharmaceutical Industry* will be available for review by the end of the year. Anyone interested in joining either of these drafting/reviewing efforts are welcome to contact E55.01 sub-chair Benoit Igne, benoit_igne@vrtx.com.

E55.03 General Pharmaceutical Standards

Chair: Paul Gil, Consultant

Subcommittee E55.03 currently has multiple standards development projects underway, covering a range of topics within the industry.

Major revisions are currently being made to **E3106-18e1** *Standard Guide for Science-Based and Risk Based Cleaning Process Development and Validation* under the work item **WK73120**. The task group has made considerable progress in 2021 and plans to ballot a fully refreshed version of the standard in early 2022.

More recently, the subcommittee approved a new work item to expand into the area of clean-in-place, starting with **WK78595** *Proposed Standard Guide for the Design of Clean in Place-Friendly Equipment for Pharmaceutical and Biopharmaceutical Applications (CbD Clean by Design)*. This latest effort was established following a presentation from Richard Hall Hall (Rattiinox) during the October 2021 meetings. A task group is being formed with a kick-off meeting to be scheduled in the coming weeks. Any members interested in the topic are welcome to contact Richard at richard@rattiinox.com.

Additional efforts under E55.03 include: **WK72293** *Standard Guide for Definition of Combination Products (Drug, Device, Biologic Combinations)* which is nearing completion and anticipated to enter balloting in Q1 2022; and **WK74514** *Proposed New Practice for Measurement of Particulate Matter in Pharmaceuticals using Automated Membrane Microscopy* which remains in development by the task group.

E55.04 General Biopharmaceutical Standards

Chair: Jeff Carter, Cytiva

The E55.04 subcommittee houses 10 standards. Of these, two are up for review under the current ASTM regulation. **E3042-16** *Standard Practice for Process Step to Inactivate Rodent Retrovirus with Triton X-100 Treatment* is set to be revised and sent for ballot in the coming months. **E2097-00(2014)** *Standard Guide for Determining the Impact of Extractables from Non-Metallic Materials on the Safety of Biotechnology Products* was discussed during the October 2021 meeting, resulting in the groups decision to ballot this

standard for withdraw due to its general lack of use in the industry.

The subcommittee also has four work items for new standards in progress. **WK65428** *Proposed Standard Guide for the Application of Continuous Processing in the Biopharmaceutical Industry* is a comprehensive guide on the topic. It has been out for ballot and has received substantial feedback, which is now being incorporated and will be re-balloted in the near future. **WK64991** *Proposed Standard Practice for Stability of Early Phase Protein Products* will reduce validation needs for proteins in early clinicals. It has been balloted resulting in a single negative vote that is currently being considered. An initial draft of **WK74440** *Proposed Standard Test Method for Physical Integrity Testing of Single-Use Systems* is nearing completion and anticipated to enter balloting before the end of the year. **WK65429** *Proposed Standard Practice for Process to Remove Retrovirus by Small Virus Retentive Filters* has been revised following a first ballot and expected to be re-balloted in Q4 2021.

Lastly, we are evaluating the possibility of initiating one or more virus clearance/inactivation standards (e.g., using anion exchange chromatography). Anyone with interest in this topic is encouraged to contact Jeff to join the conversation.

E55.05 Lyophilization

Chair: Arnab Ganguly, Amgen

E55.05 continues to work under the scope of developing, disseminating, and educating new standard practices and guides relevant to lyophilization of parenterals and other pharmaceutical and biological products. To date, the subcommittee has reached a major milestone with the completion of its first new standard.

In June 2021, work item **WK63507** was approved and published as **E3250-21** *Standard Practice for Product Temperature and Equipment Pressure Instrumentation in Pharmaceutical Freeze Drying*. This comes following critical feedback received from the previous ballot rounds, including key inputs from E55 members representing NIST and the FDA was incorporated into the document.

The subcommittee is now shifting focus to draft a follow-up standard for lyophilization process validation. The content for this new standard will be based on the recently published Best Practice Document (Jameel, F., Alexeenko, A., Bhambhani, A. et al. *Recommended Best Practices for Lyophilization Validation—2021 Part I: Process Design and Modeling*. AAPS PharmSciTech 22, 221 (2021). https://doi.org/10.1208/s12249-021-02086-8). This work describes lyophilization process validation and consists of two parts. Part I focuses on the process design and is described in the Best Practice paper, while Part II is devoted to process qualification and continued process verification. The intent of these articles is to provide readers with recent updates on lyophilization validation in the light of community-based combined opinion on the process and reflect the industrial prospective. The group will soon be looking to use the Best Practice document as the basis for another E55.05 consensus standard.

Everyone will be informed once the new work item is registered, and the task group is launched. Anyone who is interested in learning more and/or contributing to this effort is invited to contact Arnab for more detail.

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

Chair: Scott Drummond, Johnson & Johnson

Subcommittee E55.06 on Microbial/Sterility Assurance for Pharmaceutical and Biopharmaceutical Product aims to address an unmet industry need to develop standards and related content in support of the microbiological quality and sterility assurance of pharmaceutical and biopharmaceutical products.

Interest around the committee's youngest subcommittee continues to build. Membership of E55.06 is currently at 50 subject matter experts and growing. To date, the subcommittee has been involved in the following activities.

Technical collaborations with the Italian Pharmacist Association (AFI), the leading Italian scientific association of industrial pharmacists and other professionals working in the pharmaceutical and allied industries of Italy. This engagement has led to AFI subject matter experts to join ASTM E55 and participate on various E55.06 task groups and work item development.

Regarding active work items, the subcommittee currently has four open project. **WK74412** *Proposed Standard Guide*

for Critical Airflow Visualization is nearing the end of its initial drafting and has generated interest from many organizations including AFI. The final version is expected to be sent for subcommittee ballot in Q4 2021.

In August 2021, a task group was formed and has been working on **WK77957** *Proposed Standard Guide for Cleanroom Gowning Selection and Use.* The scope of this work item is to establish personnel gowning guidance for organizations who manufacture product at various levels of classifications, such as (but not limited to) cleanrooms and cleanliness-controlled environments. Currently under discussion for the standard is the types of gowns, the importance of gowning order, cleanroom behavior & respirator use.

The latest effort under E55.06 stems from discussions with industry leaders who have identified a need to draft a standard for microbial control of cell therapeutics. This work has since been registered as **WK78574** *Proposed Standard Guide for Best Practices for Microbial Control for Cell Therapeutics*. The scope of work is being defined at the moment and members will be notified once the task group is established in the coming weeks.

Work also continues to move forward on **WK69826** *Proposed Standard Guide for Template for Environmental Monitoring (EM) Trend Report.* This item appeared on ballot earlier this year, resulting in negative comments that are currently being addressed by the task group.

Anyone that has questions or would like to participate in any of these task groups under E55.06 are invited to each out to either Scott Drummond (Johnson and Johnson) or Martin Muellner (Boehringer Ingelheim).

E55.95 Roadmap for Standards Development

Chair: Louis Traglia, Commissioning Agents Inc.

The E55.95 Roadmap subcommittee continues to progress on its three primary objectives: helping to determine what standards are needed as we move forward; helping to provide overall context of the various approved standards; and to provide simple tracking of the standards development work of the committee. Recent work of the subcommittee revolves around this third objective of tracking work item development within E55.

For the first two objectives, the better part of the last year was spent surveying members and compiling the data on what standards members as well as the industry felt were needed. The list was completed and provided to the various subcommittee leads as well as the names of people willing to volunteer to support those efforts. In support of E55.95's other objectives, the main committee looked at and discussed how to best demonstrate the depth and breadth of the full committee's work, as well as where we are going. We agreed to an interactive spreadsheet. While this may seem on the surface to be a simple answer to a complex task, the team felt it provided great functionality and utility, and would be easy to use and understand.

***NOTE**: The spreadsheet referenced in this section has been included as an attachment to this issue of the Newsletter. The ASTM website is currently undergoing major updates that limit our ability to post the file and provide a link herein. Once the updates are complete, we will post the spreadsheet for easier access. If you have any issue accessing the attachment, please reach out to Lou for a copy at Louis.Traglia@cagents.com.*

The format of the spreadsheet provides the industry with a way of sorting and searching all the standards currently under the providence of E55 as well as standards currently in development. The layout is simple with three main aspects. First, in the rows are listed, organized by subcommittee are all the current E55 standards. Below the list of approved standards is a section, again organized by the subcommittee, the standards that are currently in development. Such projects are identified using the WK designation which indicated it as an open **work item**. The columns then provide a variety of topics that may be of interest to the user. E55 standards have a great deal of overlap in the topics. For example, if you are interested in Gene and Cell Therapy, you will find numerous overlaps with standards covering Single Use Systems. By sorting on any column, the user can quickly see a list of standards that are applicable to the listed area, as well as standard work items in that area that are under development which they may want to participate in writing. Each standard is listed as a hotlink to the appropriate ASTM page for that standard. (Please be aware that these links may be impacted by the aforementioned changes to the ASTM website).

The reader will note that the last several columns are not as well populated as the columns to the left. The last few columns represent emerging area of interest for E55 as well as the industry. You will note that some of the current standards are applicable to these new areas, so some guidance is available. But this also allows us, as an industry, to identify where more standards may be needed.

Everyone is encouraged to review the spreadsheet and send any feedback to Lou for future iteration of the file.

Committee Outreach

Reaching the Global Community

E55 Members Present at ISPE Biotech Conference

The recent 2021 ISPE Biotechnology Conference this past September included a presentation put together by a collective of E55 members.

The group, consisting of Jeff Carter (Cytiva/E55.04 sub-chair), Duncan Low (Claymore Biopharm LLC/E55.04 sub vice chair), Lou Traglia (Commissioning Agents//E55.95 sub-chair), provided an overview of ASTM consensus standards under the theme of facilitating productivity in bioprocessing. The session explored the role of standards in industry and showcased how standards being developed by the committee support and facilitate acceptance of improvements in productivity along with investments in new capacity. Specific standard efforts currently underway within E55 included addressing continuous biomanufacturing, continuous process verification, and single-use technologies.

Growth Continues in Industry and Academic Forums

As part of the committee's European Strategy, with strong support from the ASTM European Office, considerable progress has been made in expanding awareness and engagement in E55 globally. These efforts have led to connections with colleagues and industry organizations in Italy, Switzerland, Scotland, and beyond.

With the support to groups such the Italian Pharmacist Association (AFI) as well as the UK Center for Process Analytics and Control Technology (CPACT), the committee has made significant progress under its two leadership forums dedicated to industry and academia. Special thanks to our colleagues with AFI who have quickly joined and contributed to not only these forums but also to specific standards development work within E55. Similar efforts have been carried out thanks to the folks at CPACT along with E55 members working with the University of Strathclyde.

The committee plans to continue promoting and partnering with other organizations and universities will into 2022.

Upcoming Events

Future Meetings

Next E55 Meeting: Return to In-Person in April

E55 Committee leadership is aiming a return to in-person meetings, starting in April 2022. Plans are in place for the group to meet on April 20-21, 2022 at the ASTM International Headquarters office in West Conshohocken, PA, USA. Additional information will be distributed to the committee as it becomes available. Remote participation will be provided for those unable to attend in person.

New CPI MMIC Facility set for Oct 2022 Meetings

Planning is currently underway for the October 2022 full committee meeting, which will be held at the brand-new Medicines Manufacturing Innovation Centre (MMIC) in Scotland. The state-of-the-art facility comes as a result of collaboration between Centre for Process Innovation Limited (CPI), University of Strathclyde, UK Research & Innovation, Scottish Enterprise and founding industry partners, AstraZeneca and GSK.

The meeting is tentatively set for October 11-13, 2022 and will include a tour of the new facility and help to build new and existing relationships in the region. Stay tuned for updates as they are made available.

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Membership Updates

Colleagues in Industry

E55.05 Sub-chair Recognized for E3250

Members presented the E55.05 sub-chair, Arnab Ganguly, with an Award of Appreciation during the October meeting for his leadership in championing the development and publication of the subcommittee's first standard, **E3250-21** *Standard Practice for Product Temperature and Equipment Pressure Instrumentation in Pharmaceutical Freeze Drying*. Starting with the launch of the subcommittee in 2017, Arnab quickly learned the ASTM standards process and has since proven to be an exemplary member and leader within the committee. Please join us in thanking Arnab for his contributions and continued efforts within ASTM.

Committee Officers Selected for 2022-23

E55 welcomes the recently elected officers to the following positions for the 2022-2023 term:

Chair: **John Logar**

(Johnson & Johnson)

Vice Chair: **Don Kientzler**

(J-STAR Research)

Recording Secretary: **Jennifer Gray**

(LyoHUB, Purdue University)

Membership Secretary: **Claus Weisemann**

(NGM Biopharmaceuticals)

These four will assume their respective roles starting January 1, 2022 and will build on the direction and accomplishments of their predecessors.

The committee salutes the leadership and contributions of the outgoing officers. Special thanks go to Ferdinando Aspesi (chair 2018-2021), Russ Madsen (vice-chair 2018-2021), and Rick Van Doel (recording secretary 2020-2021) for their unparalleled service to Committee E55.

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
Murat Altun	EMA ENGINEERING INC
Dr. Darren McDonnell	SCRI-IS Technologies Ltd.
Francesco Boschi	Pfizer
Don Rackham	Asterias Biotherapeutics
Zubeda Z. Abraham	Microrite, Inc.
Lauren Specchio	Baxter
Damian Wojtowicz	PTI
Tyler Harris	PTI
Thomas O'Connor	US Food and Drug Administration
Lee Caufield	Carten Controls

Dalia Taylor	DuPont
Miguel Gonzalez Jr	ArsenalBio
Lillian L. Grace	
Dawn M. Nestola	Johnson Johnson
Santosh Kumar Parupelli	NCATSU
Weibing Ding	GSK
Anthony P. Hamilton	Measurement Science Resource LLC
Joseph P. St.Laurent	Chemic Laboratories Inc
Edita Botonjic-Sehic	Pall Life Sciences
Joshua Mann	Oetiker
Richard Hall Hall	Rattiinox
Laurel Branstrator	Eli LIlly Co
Clarence W. Baker	
Yuliya Ghanem	Amicus Therapeutics Inc

The current E55 membership consists of roughly 200 subject matter experts from around the world. Countries represented include Belgium, Canada, Chile, China, Denmark, France, Germany, Ireland, Italy, Japan, Luxembourg, Mexico, Peru, Singapore, Spain, Switzerland, United Kingdom, and the United States.

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 Specific 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.

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 voting rights and help ballots meet the necessary response requirements. Voters 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.

Additional Information

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