ADVANCING STANDARDS
TRANSFORMING MARKETS

EMERGING AIRSPACE

HEALTH AND SAFETY

ADVANCED MANUFACTURING

BUILT ENVIRONMENT AND INFRASTRUCTURE SYSTEMS

CLEAN ENERGY AND DECARBONIZATION TECHNOLOGY

Standardization Impact Report

EXECUTIVE OVERVIEW

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Executive Overview

From the roads you drive on to the products in your child's nursery to the planes that fly overhead – standards are everywhere. They enhance safety, enable process enhancements, promote improved quality and performance, and empower consumer confidence. Standards play a foundational role in development and delivery of industry, infrastructure, and innovation. In recent years, the standards developed by ASTM International's 140+ committees have underpinned major developments in the way we build, the way we manufacture, and our ventures in emerging airspace, embodying the phrase: "Advancing Standards, Transforming Markets."

AS NEW TECHNOLOGIES WITH THE POTENTIAL TO BENEFIT SOCIETY MOVE TOWARD BROADER ADOPTION, STANDARDS WILL BE A KEY ENABLING FACTOR.

As rapid technological advancements and carbon emissions are impacting human society, the world is turning its attention to sustainability as a means of securing a safer future for coming generations.

To build a more sustainable society, it will be necessary to support the accelerated growth of renewable energy sources, as well as adopt circular economy principles that emphasize reuse, repair, and recycling of existing materials. Emerging technological evolutions such as automation and AI have the potential to create greater efficiency, stimulate economic growth, and improve quality of life.

In 2015, the United Nations approved 17 Sustainable Development Goals (SDGs) to address overarching natural, social, and technological challenges. The SDGs[1] serve as a guide for strategic decision-making as organizations determine how to address sustainability issues. According to an ASTM internal survey, standards are being used to help implement many of these goals at either a foundational or business-planning level.[2]

As one of the world's oldest standards development organizations (SDO), ASTM brings together technical experts from government, academia, and industry to develop standards, with a body of work that includes more than 12,900 standards across 90 different industrial sectors. For more than 125 years, ASTM has advanced industry performance and empowered consumer confidence around the world. With an open membership model that includes more than 35,000 individual members, ASTM plays a leading role in identifying real-world standards needs and driving the development of high-impact standards that support emerging technologies. This model led the Organization for Economic Cooperation and Development (OECD) to author a report titled "The Case of ASTM International" in which they noted that "ASTM is strongly committee-led and quick to react to emerging areas in need of standardization, notably new production technologies."[3]

1 https://sdgs.un.org/goals
2 https://sn.astm.org/features/standards-and-un-sustainable-development-goals-nd20.html
3 https://web-archive.oecd.org/2021-09-10/597825-irc-astm-case-study.pdf

Executive Overview

This report was developed in response to the need for a strategic overview of global innovation trends and the role that standards can and do play in supporting them. The report will be available in sections, with detailed overviews of ASTM's role in each of these sectors being released over time. Additionally, it serves to showcase the direct links between these emerging technologies and the work of several key ASTM committees.

Internally, the report will empower continued work from the ASTM community, showcase several high-impact standards activities, and can be used in future committee strategy-planning sessions to help define the scope of work in these key industries moving forward.

THIS REPORT LEVERAGES A BROAD REVIEW OF PUBLICLY AVAILABLE INFORMATION TO PROVIDE A SNAPSHOT OF THE TRAJECTORY OF TOPIC AREAS IN WHICH STANDARDS DEVELOPMENT ACTIVITIES CAN HELP ACHIEVE OUR GLOBAL SOCIETY'S ECONOMIC AND HUMANITARIAN GOALS.

EMERGING AIRSPACE

New sustainable transportation modes for travel and commerce are currently under development and include electric vertical take-off and landing (eVTOL) vehicles, which are anticipated to allow rapid, zero-emission transport of passengers and goods. These developments are being complemented by the expansion of infrastructure to support the safer operation of drones and passenger aircraft.

HEALTH AND SAFETY

Consumers are demanding transparency regarding the safety and environmental impact of healthcare products, while advances in diagnostics and health-monitoring technologies are helping to usher in an era of more proactive, patient-driven healthcare. In addition, there is increasing emphasis on consumer safety issues such as the removal of toxic chemicals from products and transparency regarding product ingredients.

ADVANCED MANUFACTURING

Manufacturers are increasingly adopting Industry 4.0 digitalization technologies to enhance manufacturing safety, productivity, and flexibility while making increased use of digital warehousing, automation, mass customization, supply chain data, and on-demand production.

BUILT ENVIRONMENT AND INFRASTRUCTURE SYSTEMS

There is a growing demand worldwide for sustainable construction focused on the effective use of resources to build healthier, more energy-efficient, and more environmentally friendly homes, offices, and other facilities. In addition, communities are placing greater emphasis on natural hazard-mitigation planning and community resilience solutions.

CLEAN ENERGY AND DECARBONIZATION TECHNOLOGY

A global shift toward clean-energy economies is driving the development of safer and more environmentally friendly fuel alternatives, increasing the share of renewable energy and storage technologies and sparking a renaissance in nuclear power research to meet future energy needs.

Executive Overview

As part of its 125th anniversary celebration, ASTM International invited the submission of case studies from committee members around the world, highlighting standards that have made a significant impact in society. The following 11 standards were identified as the top standards for supporting safety and quality across the topic areas covered in this report. These standards are also highlighted in the corresponding subtopic sections.

STANDARD TITLE	DESIGNATION	COMMITTEE AND SUBTOPIC
Standard Specification for Biodiesel Fuel Blend Stock (B100) for Middle Distillate Fuels	D6751	Committee on Petroleum Products, Liquid Fuels, and Lubricants **(D02)** **RELEVANT SUBTOPIC** Clean Energy and Decarbonization Technologies: Biofuels
Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft3 (600 kN-m/m3))	D698	Committee on Soil and Rock **(D18)** **RELEVANT SUBTOPIC** Built Environment and Infrastructure Systems: Construction
Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft3 (2,700 kN-m/m3))	D1557	
Standard Test Methods for Determining the Biobased Content of Solid, Liquid, and Gaseous Samples Using Radiocarbon Analysis	D6866	
Standard Specification for Labeling of Plastics Designed to be Aerobically Composted in Municipal or Industrial Facilities	D6400	Committee on Plastics **(D20)** **RELEVANT SUBTOPIC** Clean Energy and Decarbonization Technologies: Sustainable Manufacturing
Standard Specification for Labeling of End Items that Incorporate Plastics and Polymers as Coatings or Additives with Paper and Other Substrates Designed to be Aerobically Composted in Municipal or Industrial Facilities	D6868	

Executive Overview

Standard Guide for Friction-Limited Aircraft Braking Measurements and Reporting	**E3266**	Committee on Vehicle-Pavement Systems **(E17)** **RELEVANT SUBTOPIC** Built Environment and Infrastructure Systems: Building and Infrastructure Resilience
Practice to Assess Virucidal Activity of Chemicals Intended for Disinfection of Inanimate, Nonporous Environmental Surfaces	**E1053**	Committee on Pesticides, Antimicrobials, and Alternative Control Agents **(E35)** **RELEVANT SUBTOPICS** Built Environment and Infrastructure Systems: Building and Infrastructure Resilience Clean Energy and Decarbonization Technologies: Sustainable Manufacturing
Consumer Safety Specification for Full-Size Baby Cribs	**F1169**	Committee on Consumer Products **(F15)** **RELEVANT SUBTOPIC** Health and Safety: Consumer Safety
Practice for Ownership, Operation, Maintenance, and Inspection of Amusement Rides and Devices	**F770**	Committee on Amusement Rides and Devices **(F24)** **RELEVANT SUBTOPIC** Health and Safety: Consumer Safety
Standard Specification for Barrier Face Coverings	**F3502**	Committee on Personal Protective Clothing and Equipment **(F23)** **RELEVANT SUBTOPIC** Health and Safety: Personal Protective Equipment

Executive Overview

NEXT STEPS

As stakeholders identify goals and priorities to address the humanitarian challenges facing our global society, standards supporting all aspects of sustainability and technology will play a critical role in achieving them. This report aims to provide a broad overview of emerging trends that can be used in concert with the UN SDGs to inform strategic decisions in the years to come.

With the aim of "Helping our world work better," ASTM International organizes collaborative initiatives and technical committees for standards development.

ASTM's integrated approach to standards development emphasizes four pillars:

- Early engagement in strategic planning, which allows ASTM International to serve as an interface between science and technology research and the market
- Robust participation of all the stakeholders needed to allow alignment of technology and process goals
- Leveraging the strengths of SDOs such as speed, collaborative expertise, and ability
- Workforce development to prepare the global workforce for interactions with critical emerging technologies and to champion the use of standards.

Participating in ASTM's work can allow you to help drive the development of needed standards and have a say in the standards that impact your field. By joining a technical committee or providing your input on standards, you can advance standards that make a meaningful impact on the future and help transform markets in support of a more sustainable world.

Explore the Standardization Impact Report

ADVANCING STANDARDS
TRANSFORMING MARKETS

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