

**MINUTES: ORGANIZATIONAL MEETING**  
**New ASTM International Activity on Glass for Solar Applications**  
**September 29, 2009**

1. CALL TO ORDER

The meeting was called to order at 1:05 p.m. by Christine DeJong, Staff Manager, ASTM International.

2. WELCOME AND SELF-INTRODUCTIONS OF ATTENDEES

Christine DeJong welcomed the attendees and initiated self-introductions. A [list of attendees](#) will be included as a separate attachment to these minutes.

3. OBJECTIVES OF MEETING

The objectives of this organizational meeting were to:

1. Bring together individuals, companies, & organizations representative of this industry to determine the best future course of action regarding standards development.
2. Identify specific areas to be addressed in the development of standards. If the participants agree on the need for standards and have an interest in developing them, then:
3. Formally establish a new activity by approving a title and scope, and
4. Secure from meeting attendees (via formal vote) a commitment to organize a new standards developing activity within ASTM International.

4. OVERVIEW OF ASTM AND THE STANDARDS DEVELOPMENT PROCESS

Pat Picariello, Director, Developmental Operations, ASTM International presented an overview of the ASTM organization and committee operations, which is summarized in the following paragraphs. The full presentation will not accompany these minutes due to file size - if you'd like a copy, please advise Pat Picariello ([ppicarie@astm.org](mailto:ppicarie@astm.org)).

ASTM, a not-for-profit corporation organized in 1898, is a management system for the development of standards and related technical information for materials, products, systems, and services. It provides a legal, administrative, and publications forum within which producers, users, ultimate consumers, and representatives of government and academia can meet on a common ground to develop standards that best meet the needs of all concerned.

ASTM's technical committee structure is made up of main committees, subcommittees, and task groups. The task groups initiate draft standards, which sub and main committees ballot following the consensus procedures described in the Regulations Governing ASTM Technical Committees. The ASTM procedures, based on due process, ensure that the standards produced are technically sound and rest on a solid legal foundation with appropriate concern for legal issues such as restraint of trade and volunteer liability.

Reasons why industries utilize the ASTM system to organize new activities include:

1. ASTM provides a management system that can address any area where the need for standards or related information exists. ASTM encourages and facilitates strong liaisons with additional standards organizations to avoid duplication of effort.
2. ASTM core competencies include timely and relevant consensus standards development, maintenance, and global distribution.
3. ASTM is a proven system that has produced more than 12,000 standards that are widely used in a global environment. These standards provide the necessary certainty in contractual agreements, regulatory initiatives, and industry self-regulation programs.
4. A full-time professional staff operating from ASTM's International Headquarters in West Conshohocken, PA provides administrative and management support to assist the ASTM membership in their standards development objectives.
5. The ASTM system provides a neutral umbrella under which all interested parties voluntarily participate in the development of standards critical to the success of their industry.

Additional items discussed and/or explained included:

- ASTM and Harmonization - Domestic & Global

From its inception, ASTM's method of developing standards has been based on consensus without borders. ASTM's process ensures that interested individuals and organizations representing academia, industry, product users, and governments alike all have an equal vote in determining a standard's content. Participants are welcome from anywhere on the globe. Further, ASTM's high quality standards are responsive and relevant to the needs of the global marketplace. More than 40 percent of ASTM's standards are sold outside of the United States.

The standards developed by this new activity will have the unique advantage of representing the needs of the global community. The breadth of multi-national company representation present on this activity will allow it to develop & potentially set the global standards of choice.

- Existing Information

A comprehensive review of the existing work product (standards & non-standards) will be one of the early agenda items for the leadership and participants of this new activity. An understanding of the nature of what's 'out there' will serve to enhance the productivity of the activity regarding the elimination of duplication of effort scenarios. Relative to existing ASTM committee activity, a notice will be sent to all ASTM committees (via their Executive Subcommittees) announcing the organization of the activity, as well as its title, scope, & structure. The notice will also offer each committee the opportunity to inform the new activity of any related standardization activity currently underway.

- Liaison Work

Establishing liaison relationships with related industry sectors, associations, consortia, & standards developers is critical to the effective and efficient development of this activity. The

new activity will, in its scope, address this issue, and may establish official liaison representatives to be appointed at the discretion of the Executive Subcommittee.

- Process for the Utilization of Existing Documents

In the event that existing ASTM standards (developed by other ASTM committees) are proven to be likely templates for new documents, it is possible (given an appropriate degree of communication with the parent committee) for portions of those documents to comprise the basis for newly developed standards. In the event that standards (or related information) developed by external organizations can serve the same purpose, no such activity can take place without discussion with and consent by the holder of the copyrighted information.

## 5. BACKGROUND ON REQUEST FOR ACTIVITY

Glenn Strahs and Edward Etzkorn, U.S. Department of Energy

The origins of the Solar Glass Standards project began with a workshop that the Department of Energy (Industrial Technologies and Solar Energy Technologies Programs) held in April 2008 (in Golden, CO) to determine how the glass and solar industries could best meet each others' needs. A Glass 101/Solar 101 tutorial (held at DOE in May 2008) was suggested and glass strength was also raised, but is being sufficiently managed by others. The development of solar glass standards was identified as a beneficial role for DOE so that any solar manufacturer could purchase their glass from different suppliers so long as it met necessary standards for transmissivity, strength, coatings and other characteristics. DOE contacted ASTM to explore if they could be the appropriate group to assist with developing solar glass standards. After several conference calls with ASTM, a Solar Glass working group and other representatives from glass and solar companies, it was decided in an extensive conference call on September 29 to convene a consensus standards development process.

### ASTM Organizational Process

When ASTM receives a request for a new activity, the official organizational process begins. ASTM staff contacts a series of individuals, companies, and organizations involved in the field to assess the level of interest and the need for the proposed activity. In this case, the results of the initial intelligence gathering were positive. At a Planning Meeting held virtually on June 22, 2009 representatives from the many stakeholders affected by the green meetings space, including the government, equipment and product manufactures, members of ASTM International [Committee E44](#) on Solar, Geothermal, and Alternative Energy Sources, members of ASTM International [Committee C14](#) on Glass, and related sectors requested that ASTM International hold an organizational meeting for the development of this new activity.

## 6. REVIEW & DISCUSSION: AREAS TO BE CONSIDERED FOR CONSENSUS STANDARDS

Extensive discussion from the floor focused on a series of areas below. Please note that this list is not intended to imply a hierarchy; merely to list the topics discussed as standards-relevant.

Address glass needed in solar devices, transmission, coatings. Glass rating for withstanding acid rain and dionized water.

- a. PV applications - crystalline and thin film
- b. Glass-

- i. Strength - heat tempering, chemical tempering, techniques to make/strengthen glass
- ii. Characteristics/types: Cover glass, Front glass, back glass, top glass, textured glass
- iii. Composition - iron, etc
- iv. used in CSP devices; transmission; use of annealed glass; pre-coated with molybdenum and other films; optical distortion in heat treated glass for PV versus architectural glass.; glossary/definitions for PV glass; size and dimension
- c. Coatings- AR for PV; silver coatings; reflective and antireflective; textured glass rating system (PV)
- d. Film Quality- coating specifications; thickness, optical properties, electrical properties, morphology, building integrated PV films, mechanical and adhesive properties, stoichiometry
- e. Durability and Reliability - mechanical properties and how it's affected by elements; longevity of structure over time; bending (CSP only-high temperature above 390 degrees Celsius; currently not for PV; CPV mirrors, focusing optics; optical properties; residual stress; existing standards:
  - i. ASTM [C1464](#) Specification for Bent Glass (Committee C14)
  - ii. ASTM [E1038](#) Test Method for Determining Resistance of Photovoltaic Modules to Hail by Impact with Propelled Ice Balls (Committee E44)
  - iii. ASTM [E822](#) Practice for Determining Resistance of Solar Collector Covers to Hail by Impact With Propelled Ice Balls (Committee E44)
  - iv. ASTM [E881](#) Practice for Exposure of Solar Collector Cover Materials to Natural Weathering Under Conditions Simulating Stagnation Mode (Committee E44)
- f. Solar hot water and heating systems ([ASTM Subcommittee E44.05](#))
- g. Terminology- E44 Standards [E772](#) and [E1328](#), C14 Terminology Standards [C162](#)
- h. Guide(s) on glass applications

## 7. DISCUSS & APPROVE TITLE & SCOPE OF ACTIVITY

Following extensive discussion, the participants agreed upon the following title and scope.

Title: Standards Developing Activity on Glass for Solar Applications

Scope: The development and maintenance of standards for glass and glass coatings for solar applications that include, but are not be limited to, photovoltaic, solar thermal, and concentrating applications. The standards will address the characteristics that affect performance, durability and reliability.

The work of this activity will be coordinated with other ASTM Committees and outside organizations having mutual interest.

## 8. SHOULD THIS ACTIVITY ORGANIZE IN ASTM?

As a result of the identification of needed standards and the value that they would provide to this industry, the following question was answered in the affirmative (with a single dissenting opinion):

“Should ASTM International organize a new standards developing activity for Glass for Solar Applications?”

9. ADDITIONAL STEPS: MOVING FORWARD

- This activity will be housed under the jurisdiction of ASTM International Committee E44 on Solar, Geothermal, and Other Alternative Energy Sources; it will carry the designation E44.20, with the title approved during this meeting.
- ASTM is soliciting volunteers to serve as officers to lead this new activity - please respond to Pat Picariello ([ppicarie@astm.org](mailto:ppicarie@astm.org)) or Christine DeJong ([cdejong@astm.org](mailto:cdejong@astm.org)) if you are interested in participating in this process.
- An ASTM press release is in the process of development relative to this new activity; several participants will be contacted to provide perspective.
- All attendees of the organizational meeting as well as all parties who indicated interest in this activity will be added to the ASTM roles and the roster of this newly formed activity at no cost for the remainder of 2009. Participants will bear responsibility for assuming full ASTM membership beginning in 2009 (\$75.00 USD per year).

10. ADJOURNMENT

The meeting adjourned at 3:43 p.m.

## Organizational Meeting Attendees (09/29/09)

| <u>Last Name</u> | <u>First Name</u> | <u>Company Name</u>                         |
|------------------|-------------------|---|
| Abbott           | Mark              | LiteSentry Corporation                      |
| Ackerman         | Mark              | AGC Automotive Americas R&D Inc             |
| Baylies          | Winthrop          | BayTech Group                               |
| Bennett          | Dan               | AGC Automotive Americas R&D                 |
| Bernal           | Andrew            | BayTech/Resor                               |
| Blacker          | Richard           | Guardian Industries                         |
| Boor             | Wayne             | PPG Industries, Inc.                        |
| Brooks           | Kevin             | PPG Industries                              |
| Burroughs        | Todd              | Architectural Testing, Inc.                 |
| Busch            | Kelly             | Cardinal                                    |
| Cairns           | Kristina          | Konarka Technologies, Inc.                  |
| Carney           | Greg              | Glass Association of North America          |
| Casas            | Adrian            | NSG-Pilkington Glass                        |
| Conour           | John              | Pilkington                                  |
| Curtin           | Bob               | AGC Glass Company North America             |
| Etzkorn          | Edward            | U.S. DOE, Solar Energy Technologies Program |
| Fitzgerald       | Janice            | A. O. Smith Corporation                     |
| Friedrich        | Klaus             | Detroit R & D                               |
| Glass            | S Jill            | Sandia National Labs                        |
| Goforth          | Doug              | Corning Incorporated                        |
| Haberer          | Jeffery           | Cardinal Glass Industries                   |
| Hinson           | Scott             | HelioVolt Corporation                       |
| Hoepfner         | Tim               | AGC Automotive Americas R&D, Inc.           |
| Hoffbeck         | Ian               | IEEE  |
| Hulme            | Richard           | Guardian Industries Corp.                   |
| Jinka            | Ashoka            | glasstech.com                               |
| Katsaros         | James             | Dupont                                      |
| Kelly            | George            | BP Solar                                    |
| Kennedy          | Cheryl            | National Renewable Energy Laboratory        |
| Knazs            | Elizabeth         | Dow corning                                 |
| Krisko           | Annette           | Cardinal Glass Industries, Inc.             |
| McGowan          | Ray               | National Fenestration Rating Council        |

|                  |          |                                       |
|------------------|----------|---------------------------------------|
| Meakin           | David    | Advent Solar                          |
| Morgan           | Kathie   | ASTM International                    |
| Morgan           | Robert   | ASTM International                    |
| Obeng            | Yaw      | NIST                                  |
| Osterwald        | Carl     | NREL                                  |
| O'Toole          | Thomas   | ASTM International                    |
| Perry            | David    | Pilkington -NSG                       |
| Postak           | Lori     | Truseal Technologies, Inc             |
| Pritchard        | M        | SunBear Solar                         |
| Purpuro          | Laurie   | K&L Gates                             |
| Quan             | Frederic | GMIC                                  |
| Sakoske          | George   | Ferro Corporation                     |
| Schimmelpenningh | Julia    | Solutia Inc.                          |
| Searle           | Norma    | Norma Searle, Consultant              |
| Shaw             | Jonathan | Cytec Industries Inc.                 |
| Sowell           | Urmilla  | GANA                                  |
| Spinosa          | Emilio   | Owens-Illinois                        |
| Stacey           | Penny    | US Glass Magazine                     |
| Strahs           | Glenn    | U.S. Department of Energy             |
| Thomas           | James    | ASTM International                    |
| Wright           | Rick     | Oldcastle Glass                       |
| Xavier           | Grace    | Sunpower Corp                         |
| Zielnik          | Allen    | Atlas Material Testing Technology LLC |