

Graphene Standardization in IEC and ISO

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Abstract

One of the key success factors for the production of GRM-based products is the availability of material with a consistent quality as well as reliable fabrication processes. This requires that all stages in the fabrication process are controlled by sophisticated TQM methods with documented material specifications, test methods and standard operating procedures. Furthermore, the manufacturer has to have a reliability assessment system in place to ensure that these products are reliable and safe. Establishing such processes is only possible with global standards that clearly define the key control characteristics and the related measurement methods. The Technical Committee 113 of the International Electrotechnical Commission has developed a consistent concept for graphene standardization which is also applicable to future standardization activities regarding other 2D materials.

This standardization process is a joint effort of IEC, ISO, CENELEC and IEEE and revolves around the central document, the standard IEC 62565-3-1. This so-called Blank Detail Specification (BDS) is a materials template that lists all relevant Key Control Characteristics (KCC) and will reference the standardized measurement protocols to measure them. Currently, the working draft of IEC 62565-3-1 includes more than 30 KCCs including “number of layers”, “sheet conductance”, and “transmission”. While the first international standards on graphene are going to be published in 2016, the number of standardization projects in the responsible committee IEC/TC 113 is increasing rapidly. In this light it is evident that all standardization activities on national, regional and international level need to be coordinated to create a consistent standards system. As IEC 62565-3-1 provides a consensus list of KCCs, this document acts as a roadmap for graphene standardization. Furthermore, it is a template for other 2D materials that will be added to the system as additional parts of IEC 62565 series.

This talk will provide a review of the international standardization activities on graphene technologies and present the status reached within the IEC, IEEE and ISO nanotechnology committees and the recently established CENELEC Workshop on “Specifications for Graphene Related Materials (CENELEC WS SGRM)”. It will point out the importance to coordinate the worldwide standardization activities. IEC/TC 113 is the right place to do this. All countries are invited to join the committee and submit their New Work Item Proposals to fill the gaps for the KCC measurement procedures and BDS standards for related 2D materials.