DISCUSSION

Authors: Newton

Norman Swindells: With composite materials you have the advantage that you begin with the concept that the materials are inherently complex. Metal standards suffer from the assumption that metal alloys are inherently simple, whereas in practice they are not; for example few alloys show a linear portion in the load extension curve. I hope therefore that your experience will feed back into the development of more realistic standards for metals.

Crystal Newton (author's response): I am hoping that some of these issues, including stress strain curves, will be addressed by members of the composite and metals communities working together.

Ranganath Shastri: At present, the test methods development in composites is industry driven for eg aerospace (SAE) or automotive (ACC) applications. What are your thoughts on how to improve or take advantage of this process in the development of composites?

Crystal Newton (author's response): I see much of the impetus for new and revised test methods coming from SACMA (Suppliers of Advanced Composite Materials Association), ASTM Committee D30 on High Modulus Fibers and their Composites, and the MIL-HDBK-17 Coordination Group. data documentation requirements are being coordinated to a certain degree among these groups. Several plans for more formal coordination among all of the composite material groups in the United States are under discussion. Ithe most important development from a database perspective would be the increased awareness of the difficulties that arise from multiple standards and the resolution of the problem.

Kamal Hossain: I agree with the authors about the difficulties of evaluating composites property data. Of the main classes of composites with polymer, metal and ceramic matrices (PMC, MMC and CMC) only PMCs have a range of standard test methods but even here harmonization of standardized methods is a significant problem at present. For MMCs and CMCs our current understanding of materials behaviour and test methods is at a very early stage. Therefore is it not premature to consider large scale computerization of composites property data for wider commercial use.

Crystal Newton (author's response): While the areas of MMC and CMC are generally not as advanced as PMC, it is not too early to prepare for computerization. Often this preparation takes the form of ensuring that data are sufficiently well documented so that different data can be compared. Some of the questions that should be addressed are: Are the materials adequately identified? Can the test be duplicated from the information presented? Are the ranges of control parameters in a given test method so wide that the values used will affect the test results? If so, are the control parameter values reported? These questions need to be addressed, whether the data sets to be compared exist on paper, in a small project-oriented database or in the arena of large scale computerization.