

PREFACE

This special issue of Nuclear Engineering and Design/Fusion is dedicated to filling a gap that has traditionally existed between materials scientists and design engineers in the field of fusion energy. The fundamental nature of research in material science, and the pragmatic applications-oriented approach of design engineers have always been difficult to reconcile. This is not unique to fusion, however, for there has always been something of a mismatch between academic depth and the pragmatic use of technology.

Practical fusion energy will be a long research and development road. A fusion system satisfying physics, engineering and environmental constraints will indeed be a challenging achievement. Given this circumstance, a more coordinated approach to materials development between the supply side (material science) and the demand side (design) is possible. The relatively long development time may be beneficial in the development of materials that serve their design function quite well, but at the same time pose little adverse impact on the environment.

In considering this special issue, we have tried to achieve a balance between several items. An attempt is made to accomplish the following:

1. An international forum for scientific research in the area of radiation effects on mechanical properties for fusion applications. Representative articles from the US, Japan and Europe are included.
2. The mixture of papers contained in this issue represent both review articles as well as original contributions.
3. The unified theme of the issue is important for the materials science and design communities. Papers contained here point to directions where research is needed on the fundamental side. Also, the sources of data inaccuracies and their design implications are discussed in almost all papers.

We would like to emphasize that this issue is not intended as a substitute for a Materials Design Handbook. Rather, individual papers present viewpoints that are based on the experience and analysis of their authors. A combination of approaches, as presented in this issue, is felt to have a desirable appeal to the materials science and design communities.

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