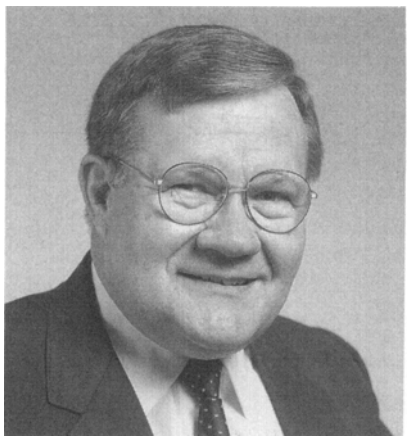
Editorial

The Design—Materials Interface



We don't like to focus attention on problems on this editorial page because, to tell you the honest truth, the world has enough problems without our adding to them. Bosnia...Chechnya...Kashmir...Sri Lanka...Algeria and the list could go on.

Besides, we don't have answers to those problems...or, in those cases where we do have answers, no one listens to us.

We will now violate our own guideline by spending some space describing a problem that has been around a long time. I do so because we at ASM are doing something about the problem in an important way.

The design—materials interface has been an issue and an administrative/managerial problem in large corporations for as long as I can remember.

I thought that the problem was unique to the particular corporation with which I was affiliated for some 25 years and to the particular ambitions and personalities of a small group, but no, it seems to be a universal condition.

I will usurp my position as editor and put forward a description of the design—materials interface problem.

The problem, as seen by the materials experts, is that design folks rely on old materials data that are extracted from old handbooks when new data are available and, even more importantly, new materials are available...and seem to be ignored by the designers. The designers simply ignore the materials people.

The problem, as seen by the designer, is that the materials department is always coming up with new suggestions for materials that have no "heritage," such as composites, nanocrystalline materials, rapidly cooled materials, splat cooled ribbons, smart materials, and damping materials.

The new materials sound very good, but the data needed by the designer is either absent or sketchy and certainly not "hard" enough to form the foundation for a design. Sometimes the designer thinks that the materials person has never heard of "product liability." The designer certainly has.

We at ASM are doing our very best to make the interface vanish. We claim a solution to the problem.

Just take a look at the table of contents in this issue. Many of the papers come from departments outside the traditional metallurgy—materials engineering areas. They come from departments of mechanical engineering, industrial engineering, and production engineering. The papers address the topics of fracture toughness, strain deformation, wear, shear deformation, creep and ductile fracture, among others.

The important point is that faculties outside of the traditional metallurgy faculty are really working on concepts from the materials areas and that is healthy.

I am reminded of a conversation from some years back when the metallurgist exclaimed to the mechanical engineer, "Amazing! You have finally discovered that all materials are not amorphous linear elastic continua, but actually have a microstructure that affects your mechanical properties." "Yes," the designer replied, "and you have discovered that mechanical properties are more complex than the uniaxial tensile test."

Just look at this issue and enjoy the contents.

John R. Ogren