American Welding Society

The Practical Reference Guide to

Welding Metallurgy

Key Concepts for Weldability

THE PRACTICAL REFERENCE GUIDE to WELDING METALLURGY— Key Concepts for Weldability

Compiled/edited/written by

Ted V. Weber

Weber & Associates

American Welding Society

550 N.W. LeJeune Road, Miami, Florida 33126

AUTHOR'S NOTES

For many, the metallurgical aspects of welding are not well understood and many of the books and technical articles dealing with the subject are sometimes difficult to master because the lay person does not have the technical background necessary to digest them. Generally, what welding personnel need is a basic understanding of the metallurgy of welding that is sufficient to aid in solving many of the day-to-day problems of fabrication or repair welding.

To that end, I have approached the subject less stringently than most, and have offered some basics that will aid the non-metallurgist in understanding why problems occur, and how to avoid them. While it is necessary to touch on the science in several areas, I have endeavored to limit it to the minimum needed for a practical understanding. I cover the effects of the various elements that make up our alloys, specifically from the weldability standpoint. The effects of cooling rates and the resulting structures are also covered from the mass effect and hardenability standpoints—a perspective I feel will be very helpful in understanding and solving many of the common welding problems.

I hope this Guide will be helpful to all, especially those non-metallurgists who have a need to avoid welding problems so often caused by overlooking the metallurgical considerations.

Ted V. Weber
Hendersonville, Tennessee

TABLE OF CONTENTS