

[Table Of Contents](#)

**Acknowledgments**

**Introduction**

**Chapter 1:**

Welding Processes and Equipment

Oxyacetylene Welding

TIG Welding

Stick Welding

MIG Welding

Oxyfuel Cutting

Plasma Cutting

**Chapter 2:**

Joint Types

Butt Joints

Tubular Structural Joints

Weld Types

**Chapter 3:**

Oxyacetylene Welding

Equipment

Purchasing Oxyfuel Equipment

Projects and Applications

Project: Welding Plate Practice

Project: Welding Pipe Practice

Application: Oxyacetylene Welding Cast Iron

**Chapter 4:**

TIG Welding

Power Options

Torch Position

Equipment

Purchasing TIG Equipment

Selecting TIG Rod

Stiffness versus Diameter

Heat-Affected Zone

Projects and Applications

Project: Making a Taillight Bracket

Application: Tubing Intersections

Application: Stainless-Steel Gas Tanks

Project: Making a Stainless Exhaust System

Application: Exhaust System

Project: Repairing Aluminum Cylinder Heads

Application: TIG Welding Titanium

Application: TIG Welding Magnesium

## **Chapter 5:**

Stick Welding 69

Electrodes 70

Equipment 70

Purchasing Stick Power 72

Filler Metals 72

Learning Stick Welding 74

## **Chapter 6:**

MIG Welding

Process Variations

Cored Wires

Gun Position

What Melts a MIG Wire?

Wire Stickout Effect on Penetration

Equipment

Standard Power Systems

Purchasing a MIG System

Wire and Gas Selection

Projects and Applications

Application: Creating an Automatic Gate Latch

Project: Welding a Hydroformed Frame

Project: Fabricating a Seat Support

Project: Repairing a Decorative Bench

Project: Mending a Weather Vane

Application: Subframe Connector

Application: NASCAR Stock Car Chassis

Application: Street Rod Roll Bar

Project: Modifying an Exercise Machine

Project: Adding a Pull-Up Device to an Exercise Machine

Project: Building a Trailer Hitch

Application: Spot Welds

Application: Triumph TR3 Floorpan Installation

Application: Street Rod and Race Car Tubing

Application: TCI MIG Welds

Application: Rear Quarter Panel Replacement

## **Chapter 7:**

Advanced Materials and Metallurgical Processes

High-Strength Steels

Alloys in Steel

Metallurgical Property Tests

Weld Defects

Project: Arc Straightening

## **Further Reading**

### **Source Guide**