

PD645

BPV Code, Section IX: Welding, Brazing, and Fusing Qualifications

Day One

- Module 1: Welding Process Basics – basic features of some more commonly used welding processes
 - Overview
 - Oxyfuel Welding (OFW)
 - Shielded Metal-Arc Welding (SMAW)
 - Gas Metal-Arc Welding (GMAW)
 - Flux Cored-Arc Welding (FCAW)
 - Gas Tungsten-Arc Welding (GTAW)
 - Submerged-Arc Welding (SAW)
 - Plasma-Arc Welding (PAW)
 - Other Welding Processes
- Module 2: Metallurgy & Welding Metallurgy – basic metallurgy concepts and how they apply to welding
 - Introduction
 - Overview
 - Basic Steel Metallurgy
 - Hardenability
 - Stainless Steels
 - Other Alloy Systems
 - Basics of Mechanical Testing
 - Basics of Welding Metallurgy

Day Two

- Module 3: Code Basics – layout, scope & responsibilities
 - Background
 - Layout of Section IX
 - Part QW Article I Welding General Requirements
 - Part QW Article II Welding Procedure Qualifications
 - Part QW Article III Welding Performance Qualifications
 - Part QW Article IV Welding Data
 - Part QW Article V Standard Welding Procedure Specifications (SWPSs)
 - Part QB Brazing
- Module 4: WPS Qualification Variables for SMAW – the basic WPS qualification variables in Table QW-253
 - Introduction
 - Variables
 - QW-402 Joints
 - QW-403 Base Metals
 - QW-404 Filler Metals
 - QW-405 Positions
 - QW-406 Preheat



- QW-407 PWHT
- QW-409 Electrical Characteristics
- QW-410 Technique
- Summary
- Module 5: Notch Toughness & Supplementary Essential Variables – notch toughness & modification of a WPS using supplementary essential variables
 - Notch-Toughness
 - Supplementary Essential Variables
 - Qualification of a WPS With Notch Toughness

Day Three

- Module 6: Developing a WPS –information needed to generate a WPS that is code-compliant, economical for the fabricator and useful to the welder
 - Introduction
 - Essential Variables
 - Nonessential Variables
 - Client Requirements
 - Developing a WPS
- Module 7: Qualifying Welding Personnel – the essential variables for qualifying welders/welding operators in Article III
 - Introduction
 - Essential Variables
 - Manual And Semiautomatic Welding
 - Other Processes
 - Automatic Welding Processes
 - Machine Welding Processes
 - Generating A Welding Performance Qualification