API 577
Welding Inspection and Metallurgy

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API RP 577, Welding Processes, Inspection, and Metallurgy, is a recommended practice developed and published by the American Petroleum Institute (API) that provides guidance to the API authorized inspector on welding inspection as encountered with fabrication and repair of refinery and chemical plant equipment and piping. Common welding processes, welding procedures, welder qualifications, metallurgical effects from welding, and inspection techniques are described to aid the inspector in fulfilling their role implementing API 510, API 570, API Std 653 and API RP 582.

The American Petroleum Institute offers API RP 577 certification training and exams for inspectors and Welding Engineers. Certification under API RP 577 is valid for a three year term. While it was once mandatory for applicants to have prior certification for API 510, 570, or 653 before one could be certified for API RP 571, 577 or 580; as of 2013 this is no longer the case, and this standard is now completely individual and stand-alone.

API 577
Introduction to Stainless Steel Metallurgy
Base Metal and Filler Metal Specifications - ASME Section II Parts A, B and C
Welding Metallurgy of Carbon and Alloy Steels
Welding Inspection
Classification of Welding Electrode
Welding Processes
Shielded Metal Arc Welding (SMAW)
Gas Tungsten Arc Welding (GTAW)
Gas Metal Arc Welding (GMAW)
Flux Cored Arc Welding (FCAW)
Submerged Arc Welding (SAW)
Stud Arc Welding (SW)
Plasma Arc Welding (PAW)
Electrogas Welding (EGW)
Welding Procedure
Welding Materials
Welder Qualification
Non Destructive Examination (NDE)
Welding Process and their discontinuities
Classification of discountinuities and identifiying defect as per relavant code
Metallurgy
Refinery and Petrochemical Plant Welding Issues

During the Preparatory course several examples, illustrations,mock up examination and case studies will be discussed and participants will be given additional reading materials and practice questions for their study purpose