

AMERICAN WELDING SOCIETY

CERTIFIED WELDING ENGINEER PART# 3 & 4

Certification Program for the Year-2025

Online Seminar &

Online Prometric Exam

Authorized International Agency:



BETZ ENGINEERING & TECHNOLOGY ZONE

Door # 21, Dharakeshwari Nagar 1st Street, Sembakkam,
Tambaram to Velacherry Main Road,
Chennai – 600 073, INDIA.

Tel: +91 44 42625390/Mobile:9840175179/9551665681/83
E.mail : rg_ganesan@yahoo.com , registration@welding-certification.com
www.welding-certification.com

BETZ ENGINEERING & TECHNOLOGY ZONE

About Us

BETZ Engineering & Technology Zone is an accredited International Agency for the American Welding Society, Florida, U.S.A., to conduct Seminars and Certification Programs for AWS in India and Worldwide. BETZ is an ISO 9001:2015 company. Also BETZ is the Only 'ATF – Accredited Test Facility' of AWS to evaluate and certify welders in India.

BETZ has been assessed and accredited by NABL in accordance with the standard ISO/IEC/17025 in the field of Testing , Non-Destructive Testing & Mechanical Testing Certificate

OVERVIEW- CWEng

The role of the Welding Engineer is critical to the integrity of the vast number of buildings, vehicles, machinery, and products that require welds. The Welding Engineer can direct those operations associated with weldments and other types of joints that are completed by the appropriate contract documents, codes, and other standards to produce a satisfactory product. The welding engineer's activities begin before production or construction welding and continue through the production process, ending when the production process is complete.

The American Welding Society (AWS) Certified Welding Engineer (CWENG) certification is among the best and respected in the industry. For more information, please review the following governing Standard:

AWS-CWEng Part# 3 & 4 SCHEDULE-2025

AWS-CWENG PART# 3 & 4 , Schedule-2025			
Month	Site Code ode	AWS-CWEng Part # 3 & 4 (Evening & Holidays Class)	Online Exam (Based on Availability from Prometric Centre)
March	IN74125	24 to 29	Monday, March 31, 2025
April	IN74225	25 to 30	Thursday, May 1, 2025
May	IN74325	24 to 29	Saturday, May 31, 2025
June	IN74425	25 to 30	Monday, June 30, 2025
July	IN74525	25 to 30	Thursday, July 31, 2025
August	IN74625	24 to 29	Sunday, August 31, 2025
September	IN74725	25 to 30	Tuesday, September 30, 2025
October	IN74825	24 to 29	Friday, October 31, 2025
November	IN74925	24 to 29	Sunday, November 30, 2025
December	IN75025	23 to 29	Tuesday, December 30, 2025

****Exam Dates – Based on availability of Prometric Centre at your Home Down**

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Eligibility:

In order to qualify for a certified welding engineer the candidate must be an individual

- a. Having Bachelor of Engineering (B.E) degree and a minimum of one (1) year relevant experience.
- b. Having Bachelor of Technology (B.Tech.) degree and a minimum of two (2) years relevant experience.
- c. Having other related Bachelor of Science (B.Sc.) degrees and a minimum of five (5) years of relevant experience.
- d. Having an Associate in Applied Science (A.A.Sc.) degree and a minimum of ten (10) years of relevant experience.
- e. who have completed high school or an equivalent program and a minimum of fifteen (15) years relevant experience.

Exam pattern

Examinations for Parts 3 and 4 are open book examinations on welding related disciplines and practical welding and related applications. Each examination is three hours in length (Duration). Part 3 has 60 questions of multiple-choice questions Part 4 has 40 questions of multiple choice type. **Candidates who successfully pass Parts 1 and 2 will be invited to sit for Part 3 and Part 4 examinations and a separate application must be submitted to AWS.**

Candidates must pass each of the four examinations with an individual score of at least 60% and attain a minimum weighted percentage of 70% for all four parts.

Seminar Pattern

We are organizing a 10-day seminar, which includes two Sundays of 8 Hours and another eight days of evening seminar classes with a minimum duration of 3.5 to 4.0 Hours.

After the seminar, we have an Exclusive Two-day session for a Review class.

Part 3 – Welding Related Disciplines (Essay Exam)

3 days seminar will be conducted to cover the NDE/Weld Discontinuities, Welding Heat Sources and Arc Physics, Welding Processes and Controls, Welding and Joining Metallurgy, Weld Design, Brazing and Soldering.

Part 4 – Practical Welding and Related Applications

3 days seminar will be conducted to cover the Welding safety, weldment design, welding metallurgy, materials, welding process selection, NDE including visual weld inspection, quality assurance, quality control in accordance with codes, specifications, other standards, and/or drawings.

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Part #3 – Welding Related Disciplines (Essay Exam)

NDE/Weld Discontinuities: • NDE processes (radiographic, ultrasonic, magnetic particle, liquid penetrant, Eddy Current, etc. — characteristics, advantages and limitations) • NDE symbols

Welding Heat Sources and Arc Physics: • Power Source Static and Dynamic Characteristics (open circuit voltage and short circuiting current, slope) • Differences Between CC And CV Designs (principle of self-adjusting) • Welding Arc Characteristics (current and voltage relationship, arc length effect) • Electron Emission (ionization potential, work function, electrode material, shielding gas and arc stability) • Arc Temperature and Degree of Ionization (shielding gas influence) • Magnetic Arc Blow (work lead location and condition) • Lorentz Force (effect on droplet detachment and on adjacent power cables) • Shielding Gas Drag Force (effect on droplet detachment and metal transfer mode) weld penetration and width for different shielding gases.

Welding Processes and Controls: • Arc Welding Processes (SMAW, GMAW, FCAW, GTAW, SAW, PAW) • Resistance Welding Processes (RW, high frequency RW), high energy density welding processes (LBW, EBW) • Cutting Processes (OFC, CAC, and PAC) • Surfacing Processing (SW, THSP) • Solid-State Welding Processes (FRW, FW)

Welding and Joining Metallurgy: • Crystal Structure of Metals (FCC, BCC, HCP, unit cells, lattice parameter, c/a ratio, atom positions, interstitial positions) • Melting and Solidification, Phase Transformations and Phase Diagrams (eutectic, eutectoid, peritectic and monotectic, lever rule calculation) metallurgy and weldability of typical engineering materials (low carbon structural steels, cast irons, stainless steels, nickel alloys, aluminum alloys, titanium alloys, etc.) microstructure (e.g., ferrous alloys—grain boundary ferrite, acicular ferrite, bainite, martensite, austenite, delta ferrite, etc.) and mechanical properties • Carbon Equivalent (CEIIW, Pcm, expressions, alloying content and carbon content effect) • Hydrogen Assisted Cracking (heat-affected zone cracking, cold cracking) base metal matching (e.g., electrodes with high strength steels) • Solidification cracking (segregation of impurity atoms, shrinkage cracking, lamellar tearing) • Delta Ferrite in Stainless Consumables, Specifications for Consumables (categories; all position, rutile, basic) • Flux metal Reactions (oxygen and sulfur control in weld pool) • Typical Temperature Range of a Heat Source • Temperature Distribution in a Weldment • HAZ Formation • Multi pass Thermal Experience, Reheated Weld Metal Properties • Weld Macro and Micro-Graph Interpretation • Solidification Profile and Preferred Grain Orientation (epitaxial growth) • Origin of Weld Ripples • Special Attributes of Base Metal (as-cast structure, deformation texture and oxide on flame cut surfaces) • Thermal Treatments (preheat, post heat, inter pass influence on weld cooling rate and residual stress distribution) • Solid-State Transformations in Welds (different forms of ferrite, bainite, and martensite, sigma phase in stainless steels, Guinier-Preston type precipitates zones and ageing in aluminum alloys) • Corrosion (sensitization in stainless steel welds and stress corrosion cracking in welds)

Weld Design: • Structural fabrication requirements, sectional properties and stress gradient • Stress triaxiality, weld symbols, hardness and microhardness (e.g., across a weld cross section) • Tensile properties, ductility, toughness, fillet break test (influence of second phase and porosity), ductile fracture, brittle fracture, fatigue (initiation, propagation, failure, high-cycle, low-cycle), temperature and strain rate effect.

Brazing and Soldering: • Characteristics of Brazing and Soldering • Fluxes and Substrates • Capillary Action • Wetting and Spreading • Contact Angle • Joint Clearance • Viscosity • Liquidus and Solidus • Flow of Molten Filler in Horizontal and Vertical Joints (Maximum Penetration and Rate) • Filler Metal Systems (Sn-Pb solders, Ni and Cu based alloys, Ag-Cu based brazing alloys) • Intermetallic Compound Formation

Safety: • Recognize health hazards relating to welding (fumes, toxic gases, noise and radiation) • Recognize safety hazards (electric shock, compressed gases, fire, welding in a confined space, welding on Containers, piping and moving equipment) • Recognize precautions to avoid injury • Possess a working knowledge of safety and fire codes

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Part #4 – Practical Welding and Related Applications

Exam using references on the application of welding engineering concepts in the areas of:

Welding safety, Weldment design, Welding Metallurgy, Materials, Welding Process Selection, NDE including Visual Weld Inspection, Quality Assurance, Quality Control in Accordance With Codes, Specifications, other Standards, and/or Drawings.

The **BETZ Faculty** includes **Professors** who have retired from leading Indian institutions. To add value, AWS handles the Code and Practical welding sessions- Qualified and Certified personnel and industry veterans with extensive on-site and deployment experience.

Exam Pattern

Examination	Number of Questions	Duration	Min % to Pass	Exam Pattern
Prometric Exam				
Part 3	60	3 Hrs	60%	Open Book
Part 4	40	3 Hrs	60%	Open Book

Minimum Weighted Percentage 70% for all Four Parts

Registration Process

All registrations must be completed, preferably Five (5) weeks before the commencement of the seminar, with full payment to avoid disappointment. For more information, call us on 9840175179 / 9551665683.

E-mail: registration@welding-certification.com / rg_ganesan@yahoo.com Upon completing the registration process, candidates can collect their Soft Copy of study materials and the AWS QC1:2016 Specification for AWS Certification of Welding Inspectors. This will help candidates start their preparations immediately.

BETZ – Indian Admin Office

BETZ – US Admin office



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Mode of Payments:

Seminar Fee is Rs.50,000/- wire transfer to the following account.

Name: BETZ Educational & Research Division

Bank: Karur Vysya Bank Ltd

Branch: Alandur

Account Number: 1104115000021458

IFSC: KVBL0001104

The exam Fee is USD755+160 wire transfer to the following account

Company Name :Betz Engineering Inc.

Bank Name : JP Morgan Chase

Account No: 629867527

Routing Number : 322271627

Swift Code : CHASUS33

Bank Address: JP Morgan Chase

334 S Diamond Bar Blvd

Diamond Bar, CA 91765, USA

ALL THE BEST