

# AMERICAN WELDING SOCIETY CERTIFIED WELDING ENGINEER

## AWS - CWEng Part # 1 & 2



AN ISO 9001 : 2015

## BETZ ENGINEERING & TECHNOLOGY ZONE

Educational & Research Division



TC - 12622

## Certification Program for the Year-2024

**BETZ is the only Accredited Test Facility in India  
for American Welding Society, USA.**

**BETZ is also an International Agency for AWS to conduct  
Seminars and Certification Exams.**

**[www.welding-certification.com](http://www.welding-certification.com)**



## About Us

BETZ Engineering & Technology Zone is an accredited International Agency for 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.

Individuals with AWS Certified Welding Engineer certification have demonstrated their skills for preparing or reviewing written instructions for the production of welded joints. They are thoroughly familiar with various codes, specifications, standards and other aspects of fabrication and assembly. The CWEng often prepares and produces reports, which accurately reflect professional judgment and is able to work with management representatives, inspection personnel, welders and support crafts, understanding the integrated role of each in the development of weldments

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

### AWS-CWEng Part# 1 & 2 SCHEDULE-2024

Month	SITE CODE	AWS-CWEng Part # 1 & 2 (Evening & Holidays Class)	Seminar City	Online Exam (Based on Availability from Prometric Centre)
February	IN63724	20 to 28	Chennai	February 29, 2024
March	IN66024	22 to 30	Chennai	March 31, 2024
April	IN69024	21 to 29	Chennai	April 30, 2024
May	IN71324	22 to 30	Chennai	May 31, 2024
June	IN73324	21 to 29	Chennai	June 30, 2024
July	IN75624	22 to 30	Chennai	July 31, 2024
August	IN77724	22 to 30	Chennai	August 31, 2024
September	IN79824	21 to 29	Chennai	September 30, 2024
October	IN82124	22 to 30	Chennai	October 31, 2024
November	IN84624	21 to 29	Chennai	November 30, 2024
December	IN87224	21 to 29	Chennai	December 30, 2024

Application must be emailed to BETZ no later than (5) weeks before the test date

## Eligibility

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



## Exam pattern

The AWS Certified Welding Engineer (CWEEng.) examination consists of four parts. Parts 1 and 2 must be successfully completed in order to take Parts 3 and 4. The first two parts (1 and 2) of the exam are closed book Online Exam and covers fundamentals of basic science and applied science. Exam will be of two hours for each part with multiple-choice questions Each examination is Two hours in length, Part 1 consists of 35 questions of multiple choices Question and Part 2 has 25 questions of multiple choice Questions . Successful candidates must correctly answer 60% of the questions to pass the examination.

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 that 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 not less than 60% and attain a minimum weighted percentage of 70% for all 4 parts.**

## Seminar Pattern

This Six days course focuses on the fundamental knowledge in Basic Sciences (Part #1) of Mathematics, Physics, Chemistry and applied sciences of (Part # 2) strength of Materials, Heat Transfer & Fluid Mechanics and Electricity.

- 2 days seminar will be conducted to cover the fundamentals of basic sciences of Part-1 examination that covers all the facets of AWS B5.16, knowledge of mathematics, physics and chemistry.
- 3 days seminar will be conducted to cover the Applied science fundamentals of Part-2 examination that covers the area of strength of materials, heat transfer, fluid mechanics and electricity.
- 1 day will be totally dedicated to discussion & review of Parts#1 and 2.

## Part #1- Basic Science Fundamentals

**Mathematics :** • Simple Calculations (multiple choices) • Special Functions (exp, log) Trigonometric Functions (sin, cos, tan, cat, sec, csc, degree, radians) • Algebraic Equations (linear, quadratic, polynomial) Graphs and Equations (slope, intercept, roots, derivatives, minimum, maximum, interpolation and extrapolation) • Geometry (common geometric shapes) Hyperbola, Parabola • Complex Numbers Calculus (fundamentals of differential equations) • Statistics (population and samples : normal distribution, mean, standard deviation and variance • Simple correlation : linear regression via least squares method, r2 correlation)

**Physics :** • Unit Conversion (dimension, mass, temperature, time, energy, power) • Mass, Weight, Volume, Density • Force, Energy, Work Done, Power • Stress, Strain, Hooke's Law (elasticity) • Moment and Momentum • Temperature, Heat, Temperature Measurements, Thermocouples, Pyrometers • Thermal Properties of Materials (Thermal Conductivity, Thermal Expansion, Thermal Stress and Strain)

**Chemistry :** • Symbols (elements and inorganic compounds - gases, fluxes, etc.) • Molecular Weight and Stoichiometry • Acids and Bases • Balance Chemical Equation • Gas Combustion Reactions (Chemical heat generation) and oxidation-reduction reactions • Ideal Gas Law (pressure, volume, temperature) • Mass Balance ( as in E7018 coating decomposition to gas, slag and metal) • Bulk and Chemical Analysis Methodologies • Reactivity, Toxicity, Environmental Effect, Disposal.

## Part #2 - Applied Science Fundamentals

**Strength of Materials :** • Load, Deformation (elastic and plastic, buckling), Stress-Strain, Young's Modulus, Shear Modulus, Stress - Strain Curve (Yield Stress, Ultimate tensile Stress, elongation) and tensile stress • Shear stress computation • Welded member cross-section effect • Mechanical testing (tensile, bend, fracture toughness, hardness, creep and fatigue) and data interpretation • Law of Conservation of Energy / Momentum • Stress analysis • Typical engineering material properties

**Heat Transfer and Fluid Mechanics :** • Heat Conductio, Convection and Radiation, Thermal Conductivity and Diffusivity, Heat Transfer Coefficients of Engineering Material and Fourier's Law • Heating Rate and Cooling Rate • Industrial Heating Methods, Power Consumption and Gas Flow Rates • Laminar and Turbulent Flow (Reynold's numbers), Dew Point and Relative Humidity, Pressure and Regulators • Venturi Effect and Gas Velocity Calculation • Atmospheris Pressure and Hyperbaric Conditions • Vacuum Equipment and Measurements

**Electricity :** Current, Voltage, Resitance, Impedance and Circuits • Ohm's Law • Kirchhoff's Law • Resistance Loss Current Rectification • Power Generation • AC / DC, Polarity • Power Factor • Electromagnetic Properties • P  
• Current and Voltage Measurements (devices and principles)



## Exam Pattern

Examination	Number of Questions	Duration	Min % to Pass	Exam Pattern
<b>Online Prometric Exam</b>				
Part 1-Basic Science	35	2 Hrs	60 %	Closed Book
Part 2-Applied Science	25	2 Hrs	60 %	Closed Book

Minimum Weighted Percentage for all Four Parts

## Registration Process

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

E-mail: [registration@welding-certification.com](mailto:registration@welding-certification.com) / [rg\\_ganesan@yahoo.com](mailto:rg_ganesan@yahoo.com) Upon completion of registration process, candidates can collect their Hard copy of study materials and AWS QC1:2016 Specification for AWS Certification of Welding Inspectors. This will help candidates to start their preparations immediate

## Mode of Payment

**Seminar Fee : Rs.40,000/- wire transfer to the following account.**

Name : BETZ Educational & Research Division  
Bank : KARUR VYSYA BANK LTD Branch : ALANDUR  
Account Number : 1104115000021458 IFSC : KVBL0001104

**Exam Fee : USD1285 wire transfer to the following account**

Company Name : Betz Engineering Inc.  
Bank Name : JP Morgan Chase Account No : 833239152  
Routing Number : 322271627 Swift Code : CHASUS33  
Bank Address : JP Morgan Chase, 334 S Diamond Bar Blvd  
Diamond Bar, CA 91765, USA

**USD120 for Prometric Sitting also transfer to the above account.**



Appropriate Course Materials will be provided well-in advance during registration, to help you prepare for the exam. Seminar kit will be provided during the first day of seminar.

Lunch and Refreshments will be provided during the seminar and exam



After completion of the seminar and 40 hours Training, Course completion certificate will be provided.

A/C Accommodation will be provided during the seminar on first come first serve basic (4 Rooms / 10 Bed only)



## Tranining Venue :

## BETZ ENGINEERING & TECHNOLOGY ZONE

Door # 21, Dharakeshwari Nagar 1st Street,  
Sembakkam, Tambaram to Velacherry Main Road,  
Chennai – 600 073, INDIA.  
Tel: +91 44 - 2278 0291

**Mobile: 9840175179 / 9551665681 / 83**

E-mail: [rg\\_ganesan@yahoo.com](mailto:rg_ganesan@yahoo.com),  
[registration@welding-certification.com](mailto:registration@welding-certification.com)



**[www.welding-certification.com](http://www.welding-certification.com)**