



# American Welding Society

**S E N S E**

## **INTRODUCTION and BACKGROUND:**

The American Welding Society is pleased to present three voluntary national skill standards for the training and qualification of welding personnel, Level I – Entry Welders, Level II – Advanced Welder, and Level III – Expert Welder. Within these guides you will find information related to:

- AWS QC10, Specification for the Qualification and Certification of Level I – Entry Welder
- AWS QC11, Specification for the Qualification and Certification of Level II – Advanced Welder
- AWS QC12, Specification for the Qualification and Certification of Level III – Expert Welder

Combined, these standards along with the associated Guides make up the AWS Schools Excelling through National Skill Standards Education (SENSE) program. The AWS QC10, QC11, and QC12 documents establish the basis for administering the AWS SENSE program and define certification requirements. The EG2.0, EG3.0 and EG4.0 documents are the Guides containing learning objectives, performance conditions, evaluation criteria and learning activities necessary to accomplish training as a Participating Organization under the AWS SENSE program. This information is available to your institution as part of our commitment to provide quality education and training programs based on industry needs and to advance to science, technology and application of welding.

On July 2, 1993, the American Welding Society was awarded a grant through the U. S. Department of Education to develop, organize and operate a Business-Labor-Education Committee. The AWS Education Grant Committee participated in the preparation of a skill standard and curriculum leading to the certification of individuals as “Entry Welders”. The project title was “Business and Education Standards Program – Development of Standards and Certification for Entry Welders”. The total cost of the project was \$1,072,466.85. The portion funded with federal funds was \$525,508.73 (49%). The portion funded by the American Welding Society was 546,985.06 (51%).

On January 5, 1995, The American Welding Society was awarded an extension to the original grant provided by the U.S. Department of Education to develop and prepare additional national skill standards and program guides leading to the certification of individuals as “Level II – Advanced Welders, and Level III – Expert Welders”. The total cost of the second phase of this project was \$1,059,626.00. The portion funded with federal funds was \$529,813.00 (50%). The portion funded by the American Welding Society was \$529,813.00 (50%).

The three deliverables for both phases of the project include:

- Standards for Level I - Entry Welders (AWS QC10), Level II – Advance Welders (AWS QC11) and Level III – Expert Welder (AWS QC12)
- Guides for training Level I - Entry Level Welders (AWS EG2.0), Level II - Advance Welders (AWS EG3.0) and Level III - Expert Welder (AWS EG4.0)
- Certification programs for Level I - Entry Level Welders, Level II - Advance Welders and Level III - Expert Welder

The Education Grant Committee personnel consisted of a consortium of AWS members representing the interest of the following sectors:

- Business Community – The employers of welders
- Trade Unions – The representatives of welders
- Educators – The trainers of welders
- Technical – The intellectual leaders of welders
- Welding equipment manufacturers – Providers of tools and equipment used by welders
- American Welding Society – A professional organization representing the welding community

The process of developing all national skill standards and guides for SENSE involved a combined effort on the part of industry-education, the AWS committee-staff, and the following areas of occupational task analysis:

### **Needs Assessment**

Two needs assessment instruments were developed to collect data concerning entry, advanced and expert level job requirements for welders. These instruments consisted of a direct mail survey to obtain industry and education feedback regarding hands-on skills, welding related knowledge, qualification testing and foundation skills such as reading, writing, math, listening-oral communication, employability and leadership. In addition, the second instrument helped identify expert welder requirements for welding positions, filler metals, job experience, supervision and welding inspection and testing. From AWS membership roles, an original mailing list was developed. The total returns were sufficient to validate both survey and allow the committee to continue with the project. The mailing sort was based on a 5:1 ration of experienced welders, supervisors, foremen and technicians to all other job classifications included in the Standard Industry Code (SIC) for the survey. A broad range of industries and educational settings were included. This range reflected the overall membership of the American Welding Society. Mailing was done on a national basis with respondents representing all fifty states, all of businesses, all job classifications and all industrial or educational areas.

### **Needs Analysis**

Data collected from the survey instruments was analyzed and compared against past American Welding Society studies to determine industry's requirements for employment as Level I – Entry Welders, Level II – Advanced Welder or Level III – Expert Welder. These additional studies included AWS Education Committee work related to welders' skills and a DACUM (Design A Curriculum) facilitation consisting of a panel of experienced welding professionals whom identified welder skills. As a result of our analysis, profiles of the Entry Welders, Advanced Welder and Expert Welder emerged. Industry data also revealed that, besides hands-on training and qualification, a written test of welding related knowledge, welding procedures and safety was required prior to final performance qualification testing and certification.

**Task Analysis**

Expanding upon the information provided in the industrial surveys, other AWS studies and the emerging welder profiles, a task analysis was performed. This analysis process involved two stages: occupational data collection and conversion to programmatic materials. The purpose of the task analysis was to establish the basis for developing a competency based welder training program and the preparation of knowledge and performance related activities for a given training objective.

**Guidelines and Standards Development**

The information identified during task analysis then went through a transition which produced the three SENSE standards; AWS QC10 (Entry Level) AWS QC11 (Advanced Level) and AWS QC12 (Expert Welder) and the three program guides; AWS EG2.0 (Entry Level), AWS EG3.0 (Advanced Level) and AWS EG4.0 (Expert Level). These requirements were established by voluntary consensus of the AWS Education Grant Committee approved by the AWS Education Committee and the AWS Executive Committee.