

# ARIZONA REGISTRAR OF CONTRACTORS

## C-78 (CR-78) SOLAR PLUMBING, LIQUID SYSTEMS ONLY (RESIDENTIAL/COMMERCIAL)

### SCOPE OF WORK

Installation, alteration and repair of solar water heating systems operating at temperatures not exceeding 220°F, including thermosyphon, direct (open loop) and indirect (closed loop), but excluding air as a transfer medium. Includes installation of collectors, storage and expansion tanks, heat exchangers, piping valves, pumps, sensors, and low voltage controls that connect to existing plumbing and electrical stub-outs at the water tank location. Installation of solar heating systems for swimming pools that tie into and operate from the conventional pool system, but excludes all non-solar plumbing, electrical, and mechanical systems and components. Installation of back-up and auxiliary heating systems only when such systems are included in the original contract and when such systems are an integral part of the solar collector or storage equipment.

The trade test is considered equivalent for these classifications and upon passing the CBME and trade exam, either license classification may be applied for without further testing.

# of Questions	Minimum Passing Score	Time Allowed
60	70%	150 Minutes

### CONTENT OUTLINE

Subject Area	# of Items
General Plumbing	15
Pipes and Materials	7
Open and Closed Loop Systems	8
Pumps and Storage Systems	8
System Designs	12
Collectors	5
Controls	5

### REFERENCE LIST

To find reference materials, you may use the link provided or search for the material online via a search engine such as Google. You may also go to PSI's online store at [www.pSIONlinestore.com](http://www.pSIONlinestore.com).

The reference material listed below was used to prepare the questions for this examination. The examination may also contain questions based on trade knowledge or general industry practices. **Except for Code books**, you can base your answers on later editions of references as they become available. For Code questions, the examinations will be based **only** on the edition of the Code book that is listed.

Candidates may use a silent, nonprinting, non-programmable calculator in the examination center.

*The following reference material is allowed in the examination center:*

*Code of Federal Regulations - 29 CFR Part 1926 (OSHA), with latest available amendments, U.S. Government Printing Office, (866) 512-1800 or <http://www.access.gpo.gov/nara/cfr/cfr-table-search.html>*

**OR**

*Code of Federal Regulations - 29 CFR Part 1926 Selections by PSI, with latest available amendments, 3210 E Tropicana, Las Vegas, NV 89121, (800) 733-9267, [www.pSIONlinestore.com](http://www.pSIONlinestore.com) (See order form at the end of the Candidate Information Bulletin.)*

*International Plumbing Code, 2009, International Code Council, (800) 786-4452, [www.iccsafe.org](http://www.iccsafe.org)*

*International Mechanical Code, 2009, International Code Council, (800) 786-4452, [www.iccsafe.org](http://www.iccsafe.org)*

*The following reference material is not allowed in the examination center:*

*Mathematics for Plumbers and Pipefitters, 7th Edition, 2008, Cengage Learning.*

*IPT's Pipe Trades Handbook, 1991, Robert A. Lee, IPT Publishing & Training, Ltd., [pipefitter.com/store](http://pipefitter.com/store)*

*Solar Water and Pool Heating Design and Installation Manual, 2006, Florida Solar Energy Center, 1679 Clearlake Road, Cocoa, FL 32922-5703, (321) 638-1015, [www.nabcep.org/wp-content/uploads/2013/08/FSEC\\_Solar\\_Water\\_and\\_Pool\\_Heating\\_Manual.pdf](http://www.nabcep.org/wp-content/uploads/2013/08/FSEC_Solar_Water_and_Pool_Heating_Manual.pdf)*

Candidates are responsible for bringing their own references to the examination center. Reference materials may be highlighted, underlined, annotated and/or indexed prior to the examination session. However, references may not be written in during the examination session. Any candidate caught writing, highlighting, underlining and/or indexing in the references during the examination will be reported to the Arizona Registrar of Contractors. Furthermore, candidates are not permitted to bring in any additional papers (loose or attached) with their approved references. References may be tabbed/indexed with permanent tabs only. (permanent tabs are defined as tabs that would tear the page if removed). Temporary tabs, (defined as Post-It notes, or other tabs that may be removed without tearing the page) are not allowed and must be removed from the reference before the exam will begin. If you are downloading from the Internet, you may bring this reference into the testing center with you as long as it is bound. You can have it spiral bound or you may hole-punch it and put it in a binder.

