



HVAC Competition

FACT SHEET

Project Manager

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For questions related specifically to the HVAC competition, contact Mitch Clark, HVAC project manager, (602) 558-1618 or mclark@comfortsystemsusa.com. For all event questions, contact Lisa Nardone, National Craft Championships director, (202) 595-1789 or nardone@abc.org.

Specific Competition Eligibility

The HVAC competition has no competition-specific eligibility requirements. Please refer to overall eligibility requirements listed in the guidebook.

Written Exam

Important news for 2020—The written exam must be completed before competitors arrive onsite. Exceptions will be made for extreme circumstances with prior approval of the NCC director via email. If an exception is granted, the make-up exam will take place Wednesday, March 25, 8:30 a.m.-11 a.m. and be proctored onsite by NCCER. Only those competitors with prior approval from the NCC director will be allowed to exam the test onsite. All competitors must sit for the written exam or face disqualification from the NCC. The written exam continues to make up 25 percent of one's overall competition score.

Competitors will complete the written exam at a local NCCER Accredited Assessment Center prior to arriving onsite. It is the responsibility of the sponsor organization to schedule test sessions directly with NCCER by emailing a request to: NCCTest@nccer.org SUBJECT: Schedule NCC Test.

NCCER will contact the sponsoring organization to provide access to the written test in NCCER's Online Testing System. Information on accessing the Testing System will be provided including requirements for the testing proctor.

All exams/tests are based on the standardized craft training process. In addition to the knowledge and skills required for each competition, all competitors should have completed the NCCER Contren® Learning Series Core Curriculum modules. A non-programmable calculator will be provided for the written exam, but no reference materials are permitted.

Practical Performance Test Description

The practical performance test involves the reading and interpretation of blueprints, recovery, evacuation, leak test and recharge refrigerant of air conditioning equipment. Competitors must perform soldering and brazing techniques on a specific application; wire high- and low-voltage power supplies, the assembly and installation of some sheet metal plenums attaching to a package rooftop system; and perform electrical troubleshooting techniques. All competitors should possess basic blueprint reading skills, air conditioning and heating systems experience, including startup and commissioning of air conditioning systems, as well as knowledge of programmable thermostats.

Knowledge and Skills Required

The knowledge and skills for this competition are based on all levels of the NCCER Contren® Learning Series HVAC curriculum, with particular emphasis on the following modules:

- Introduction to HVAC
- Tools of the Trade
- Copper and Plastic Piping Practices
- Soldering and Brazing
- Basic Electricity
- Introduction to Cooling
- Introduction to Heating
- Introduction to Control Circuit Troubleshooting
- Accessories and Optional Equipment
- Leak Detection, Evacuation, Recovery, and Charging
- Troubleshooting Electric Heating
- Troubleshooting Cooling
- Troubleshooting Accessories
- Troubleshooting Electronic Controls
- System Startup and Shutdown

Tools Required

Each competitor must bring the tools listed below to the competition. Tools may be examined prior to the practical performance test below. If a tool, necessary to complete the practical performance test is not listed, the National Craft Championships Committee will provide it:

- Tubing cutter and tubing reamer
- Swedging tool (1/2-inch)
- Level
- Manifold gauge set (410A refrigerant)
- Digital thermometer
- Needle-nose pliers
- Channel-lock pliers
- Screwdrivers (slotted and Phillips)
- Nut runners (1/4- to 5/16-inch)
- Tape measure
- Voltmeter
- Ohmmeter
- Black electrical tape
- Small spray water bottle
- Striker
- Micron vacuum gauge with additional hoses if needed
- Allen wrenches
- Small pocket screwdriver (straight tip)

Tools and equipment supplied by NCC onsite:

- Turbo torch Kit
 - Utilize gloves while in use
 - Ear plugs at competitors' discretion
- Vacuum pump
- Flaring tool
- Recovery machine with bottle
 - Utilize gloves while handling refrigerant
- Refrigerant scales
- Utility knife
 - Utilize gloves while in use
- Cordless drill gun with assorted bits

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- Hammer

Sample Score Sheet

The following sample score sheet is provided to give competitors an **example** of the criteria that may be included in the practical performance test. **However, this score sheet is only a sample and not intended to act as a study guide in preparation or to imply specific criteria that will be judged during the actual practical performance test.**

ABC National Craft Championships HVAC Sample Score Sheet

| Judging Criteria | Competitor Identification Numbers | | | | | |
|---|-----------------------------------|--|--|--|--|--|
| | Maximum Points | | | | | |
| Soldering and brazing | | | | | | |
| Layout of work | | | | | | |
| Leak check | | | | | | |
| System components | | | | | | |
| Diagram accuracy | | | | | | |
| Troubleshooting | | | | | | |
| System recovery, evacuation and recharge | | | | | | |
| Sequence of work Care and use of tools General | | | | | | |
| – ability to follow directions, quality of workmanship, neatness, best use of time and completion | | | | | | |
| Project disassembly | | | | | | |
| SUBTOTAL: | 160 | | | | | |
| Safety – housekeeping | | | | | | |
| Use of hard hat | | | | | | |
| Use of safety glasses | | | | | | |
| Use of power tools | | | | | | |
| Proper footwear | | | | | | |
| SUBTOTAL: | 40 | | | | | |
| GRAND TOTAL: | 200 | | | | | |
| Tie Breaker #1 | | | | | | |
| Tie Breaker #2 | | | | | | |
| Tie Breaker #3 | | | | | | |
| Tie Breaker #4 | | | | | | |