
Written and Performance Exam General Overview

- The intent of this exam is to assess your ability to teach the skills found in the Massachusetts Technical Education Framework.
- This exam is aligned to the frameworks which can be accessed [here](#).
- Many questions and tasks require a synthesis of knowledge based on experience in the field and may not be found in any book.
- Candidates are encouraged to prepare for their exam by reviewing textbooks and reference material which has been listed as part of this exam outline. These resources can be found using online search tools, online vendors, and websites.
- Contact the Technical Teacher Testing Office if you need further assistance in locating resources listed in the exam outline.
- Use this exam outline and the Massachusetts Technical Education Framework to focus your preparation for the exam.

Written Exam

- Number of Questions: 100
- Administration Time: 3 hours
- Administration Method: Remote Proctoring Online Session

Written Exam Content Coverage

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- 10% Health & Safety**
- Regulations and Practices
- 10% Fundamentals of Metal Fabrication and Joining Process**
- Terminology
 - Measurement
 - Hand Tools
- 20% Blueprint Reading**
- Print Terminology
 - Views
 - Material Layout
- 5% Hand and Power Tools**
- 15% Metal Fabrication Processes**
- Mechanical Cutting
 - Metal Forming
 - Cutting and Gouging

25% Welding and Joining Processes

- Oxy-Acetylene
- SMAW
- GMAW
- Flux Core
- Gas Tungsten Arc Spot Welding

15% Metal Fabrication & Joining Technologies Related Mathematics

Written Exam Reference Materials (Reference Current Edition)

- **Metalwork Technology and Practice** by Victor Repp (McGraw-Hill/Glencoe)
- **Blueprint Reading for Industry** by Walter Brown (Goodheart-Willcox)
- **Welding Principles & Applications** by Larry Jeffus (Cengage)
- **Math For Welders** by Nino Marion (Goodheart-Willcox)

Materials Needed for the Written Exam

- A four-function calculator is included in the online testing system. No other calculators are permitted.
- Scrap paper and pencil/pen are permitted.

Written Exam Sample Items

Each question on the exam consists of one incomplete sentence or question followed by four choices. Some items reference an image or diagram. A few sample items are included below; the correct answer is designated with an asterisk (*).

When is a fire watch needed?

- a. When welding and cutting around combustible materials
- *b. When welding within 35' of combustible materials, or when sparks can reach materials further than 35' away
- c. When only welding or cutting in a confined space
- d. When welding above other work areas

What is meant by a welding machine Duty Cycle?

- a. The amount of time the machine switches to high frequency mode
- b. The Duty Cycle controls the polarity of the welding machine
- *c. It is the percentage of time a welding machine can be used continuously at full amperage
- d. A welding machine does not have a Duty Cycle of operation

Performance Exam

- Administration Time: 4 hours and 30 minutes
- Administration Method: Onsite at an approved Teacher Testing Location

Performance Exam Content Coverage

32% Flange with Round Cylinder Ring

- Candidate will demonstrate safety layout technique and use of power stationary equipment, incorporate plasma to cut, fabricate and GMAW/GTAW to weld product according to specifications and OSHA Safety and Industry Standards.

20% Fabricate and Weld Aluminum or Steel Cover

- Candidate will layout and operate power and manual stationary equipment, to fabricate a metal box cover using GTAW or GMAW to specifications and OSHA Safety and Industry Standards.

40% Fabricate and Weld a H.R.S. Steel Box with Handles

- Candidate will demonstrate layout technique, power stationary equipment, fabricate and weld steel box to specifications and OSHA Safety and Industry Standards.

8% Safety

Candidate-Supplied Materials Required for the Performance Exam

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|---|--|-------------------|
| • Face mask (cotton face covering or respirator which fully cover the nose and mouth) | • Industry-Approved Work Clothes and Boots/Shoes | • Center Punch |
| • Eye Protection | • Lineman's Plier/Cutter | • Dividers |
| • Gloves | • Steel Tape | • Chipping Hammer |
| • Welding Helmet | • Square | • Wire Brush |
| • Welding Goggles | • Scratch Awl | • Protractor |
| | • Hammer | • Calculator |
| | | • Dial Caliper |

Note: No books or notes will be allowed. Cell phones are prohibited during the exam administration.

The following is a list of machines available for use at the exam site.

- 175 Ton Accurpress (for bending)
- AccurShear (for cutting)
- Hypertherm PowerMax 45 (Plasma Cutter)
- Welding Machines
 - Syncrowave 250 (Stick, Tig)
 - Shopmate 300DX (Mig)
 - Millermatic 251 (Mig)

Onsite Performance Exam Requirements

- Candidate must practice social distancing and wear the appropriate face covering that covers the nose and mouth while at the exam site.
- Testing sites may have individual requirements based on location and the current guidance from the Center for Disease Control and Prevention (CDC).

Performance Exam Reference Materials (Reference Current Edition)

- **Safety Orientation** by NCCER (Pearson Prentice Hall) www.crafttraining.com
- **OSHA Regulations** www.osha.gov
 - [1910.1200 - Hazard Communication](#)
 - [1910 Subpart I - Personal Protective Equipment](#)