



Hazardous Materials Technician Certification

Skill #21 Grounding and Bonding	Maximum Time Allowed: 25								
<u>INSTRUCTIONS TO THE CANDIDATE</u>									
<ol style="list-style-type: none"> 1. This is Skill #21 for Hazardous Materials Technician. Working as a team of 2 or 3, this skill requires you to bond and ground a damage container and the product transfer devices provided. 2. Given a Megger Earth Tester Kit or equivalent, demonstrate the ability to establish a bonding and grounding field and take readings to insure the field is efficient. Assume you are working in the appropriate PPE and with an assigned crew, in accordance with your local policies and procedures. 3. The evaluator will prompt you to answer specific questions during you evaluation. The time used to answer these questions is included in the time you are allowed for this evaluation. 4. Your evaluator will provide you with the containers and appliances that are to be included in the field. 5. You have 25 minutes to complete the activity. If you have any questions, ask the evaluator. 									
CANDIDATE PERFORMANCE									
	<table border="1" style="margin: auto; border-collapse: collapse;"> <tr> <td colspan="2" style="text-align: center;">1st Attempt</td> <td colspan="2" style="text-align: center;">2nd Attempt</td> </tr> <tr> <td style="text-align: center;">Yes</td> <td style="text-align: center;">No</td> <td style="text-align: center;">Yes</td> <td style="text-align: center;">No</td> </tr> </table>	1 st Attempt		2 nd Attempt		Yes	No	Yes	No
1 st Attempt		2 nd Attempt							
Yes	No	Yes	No						
Area is monitored with a Combustible Gas Indicator for the existence of flammable vapors. If the concentration is at or near 10% of the lower explosive (LEL), corrective action is identified and taken.	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td style="width: 25%; height: 20px;"></td><td style="width: 25%;"></td><td style="width: 25%;"></td><td style="width: 25%;"></td></tr> </table>								
Bonding cables are placed on a clean, grease-free, paint-free surface with the first bonding connection made at the damaged unit. All pump-off appliances are bonded by connecting a bonding cable from the container to the appliance.	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td style="width: 25%; height: 20px;"></td><td style="width: 25%;"></td><td style="width: 25%;"></td><td style="width: 25%;"></td></tr> </table>								
Selects and prepares an appropriate grounding device, connecting grounding cable/s initially to the damaged container with the final connection made to the grounding device.	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td style="width: 25%; height: 20px;"></td><td style="width: 25%;"></td><td style="width: 25%;"></td><td style="width: 25%;"></td></tr> </table>								
Uses an ohmmeter to check the resistance to all connections, insuring readings are 25 ohms or less.	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td style="width: 25%; height: 20px;"></td><td style="width: 25%;"></td><td style="width: 25%;"></td><td style="width: 25%;"></td></tr> </table>								
Performs a “three terminal” earth resistance test for a grounding source device connecting the tester to the grounding device, as well as a separate field at specified distances from the tester.	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td style="width: 25%; height: 20px;"></td><td style="width: 25%;"></td><td style="width: 25%;"></td><td style="width: 25%;"></td></tr> </table>								
Activates the tester’s generator and measures amps and volts and then the meter will measure the resistance (ohms). Reports measurements to the evaluator.	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td style="width: 25%; height: 20px;"></td><td style="width: 25%;"></td><td style="width: 25%;"></td><td style="width: 25%;"></td></tr> </table>								
Total steps candidate must complete to pass:	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 25%;"></td> <td style="width: 25%; text-align: center;">6</td> <td style="width: 25%;"></td> <td style="width: 25%; text-align: center;">Total</td> </tr> </table>		6		Total				
	6		Total						

♦ **Critical Step** - Failure on this step results in failure of the entire skill.

Candidate Name _____

1st Evaluator Signature _____ Date _____

2nd Evaluator Signature _____ Date _____



Hazardous Materials Technician Certification

Skill #21 Grounding & Bonding

Objective(s): **7.4.3(7) and A.7.4.3(7)(1-3) NFPA Standard 472 2008 Edition**

INSTRUCTIONS TO THE PROCTOR/EVALUATOR

1. This is Skill #21 for Hazardous Materials Technician. This skill requires the candidates, working in a team of 2 or 3, to deploy a ground resistance tester and an ohmmeter to measure the resistance of connections in the bonding process and the earth's resistance to a ground source.
2. Ensure all supplies are available and in serviceable condition. Supplies include the following:
 - a. Megger Earth Tester Kit
 - b. Damaged container (maybe simulated with an appropriate metal device)
 - c. Product transfer appliances (i.e., pump, stinger, hoses, etc.)
 - d. Receiving container (maybe simulated with an appropriate metal device)
3. Direct candidates to check the Grounding & Bonding Kit to ensure all necessary components are available and functional.
4. Read the directions to the candidates. Answer any questions. Remind candidates that 25 minutes is allowed for the evaluation activity.
5. During the evaluation activities answer any questions by candidate that do not provide operational instructions for performing the required skills.
6. Direct the candidates to establish an appropriate bonding and grounding field and take all required readings with the kit provided.

NOTE: The candidates should place the ground field in straight lines from the earth ground (grounding rod or other device) being tested. Candidates should place additional rods into the ground at 45 and 90 feet from the instrument. The tester should be approximately 10 feet from the ground field being tested. The cable going to the rod 90 feet away is connected to the P2 terminal. The C1 and P1 terminals are jumpered together and the ground field cable is then attached to the jumpered C1P1 terminal.

7. When the candidates are finished, or when time expires, collect all supplies.

Proctor/Candidate Comments

I was informed of the task steps missed that resulted in the failure of this skill and the OSU-FST re-test policies.

Candidate Signature

Date