ARC WELDING

7.1. Vocabulary

Ex. 1. *Match the words with their definitions.*

1. chipping hammer 	a. a tool used to hold and control the welding electrode during the welding process.
2. moisture	b. to establish a closed loop path for electricity to flow through.
3. power source	c. a cable that connects the welding electrode to the welding machine.
4. to complete the circuit	d. water or other liquid present in small quantities, often causing rust or corrosion.
5. electrode holder 	e. the material on the surface of a welding rod that helps protect the weld from impurities.
6. ground lead	f. a handheld tool with a sharp edge used to remove slag and spatter from a welded joint.
7. flux-coating content	g. the origin of electrical energy used to power a device or machine.
8. electrode lead	h. a wire that connects an electrical circuit to the ground for safety purposes.

Ex. 2. *Complete the sentences with the given words:*

chipping hammer, ground, complete the circuit, electrode, holder, moisture, power source, flux-coating

The _____(1) used in arc welding is usually a high voltage machine.

Make sure to _____(2) lead properly before starting the welding process.

The _____(3) lead should be connected securely to the welding machine.

Always use the correct electrode _____(4) for the type of welding being done.

To _____(5), connect the circuit breaker and start the welder.

Excessive _____(6) can cause problems during the welding process.

Check the _____(7) content on the electrodes before starting to weld.

Use a _____(8) to remove slag after completing the weld.

7.2. Reading

Ex. 1. *Read the text.*

ARC WELDING

Arc welding is a type of welding that uses a welding power supply to create an electric arc between an electrode and the base material to melt the metals at the welding point. They can use either direct (DC) or alternating (AC) current, and consumable or non-consumable electrodes. The welding region is usually protected by some type of shielding gas, vapor, or slag. Arc welding processes may be manual, semi-automatic, or fully automated.

First developed in the late part of the 19th century, arc welding became commercially important in shipbuilding during the Second World War. Today it remains an important process for the fabrication of steel structures and vehicles.

To supply the electrical energy necessary for arc welding processes, a number of different power supplies can be used. The most common classification is constant current power supplies and constant voltage power supplies. In arc welding, the voltage is directly related to the length of the arc, and the current is related to the amount of heat input.

Although a number of commercial devices are available, arc welding generally requires three phases of electrical power. This is because the intense heat needed for welding requires a very high current. The process also requires a form of shielding gas to protect the weld area from atmospheric contamination.

There are several types of arc welding: shielded metal arc welding (SMAW), called manual metal arc welding (MMA) or stick welding; gas metal arc welding (GMAW), also known as metal inert gas or MIG welding; flux cored arc welding (FCAW), where a continuously fed electrode provides the filler metal; gas tungsten arc welding (GTAW), also known as tungsten inert gas (TIG) welding; and submerged arc welding (SAW), which is generally used for thick sections of steel.

The development of the continuous electrode wire feed in the 1920s increased the speed of the process and allowed for much greater control of the weld area. Arc welding was first applied to aircraft during the Second World War, as part of the war effort. The process became more popular in the post-war boom of the 1950s, and became widespread in shipbuilding and construction.

Ex. 2. *Answer the questions.*

1. What is arc welding and how does it work?

2. How did arc welding become important during the Second World War?

3. What are the different types of power supplies used in arc welding processes?

4. Why is a form of shielding gas necessary in arc welding?

5. What are the main types of arc welding techniques mentioned in the text?

6. How did the development of continuous electrode wire feed impact arc welding?

7. Why did arc welding become more popular in shipbuilding and construction after the Second World War?

7.3. Communication

Ex. 1. *Make sentences using the following words:*

1. electricity/join/metal
2. protective/gear/safety
3. welding/helmet/eyes
4. right/welding/equipment
5. safety/guidelines/prevent
6. set/up/welding
7. type/metal/welding
8. taken/welding/class
9. finished/weld/secure
10. cleaning/metal/better