

UNIT 2. FROM THE HISTORY OF WELDING

2.1. Vocabulary

Ex. 1. Match the words to their Russian equivalents.

1. blacksmith	a. чередование слоев
2. cast iron	b. ковка молотом
3. joining	c. сплошное соединение
4. carburization	d. чугун
5. riveting	e. сварка плавлением
6. hammer forging	f. науглероживание
7. fusion welding	g. производить клёпку
8. interlaying	h. кузнец
9. continuous joint	i. соединение

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

resistance welding, tungsten-inert gas, butt, coated electrode, consumable, spot and seam joining, arc welding

The welder decided to use a _____(1) electrode for the project.

In arc welding, a _____(2) is often preferred for better results.

For _____(3), it is crucial to ensure proper pressure and current flow.

_____ (4) requires a skilled operator to control the heat and fusion process.

_____ (5) welding is commonly used in joining two pieces of metal together.

_____ (6) techniques are essential in achieving strong welds.

_____ (7) welding provides a clean and precise weld in certain applications.

2.2. Grammar

Ex. 1. Put the words in the correct order.

1. been / for / has / to / welding / centuries / metals. / join / used
2. age. / back / to / the / dates / bronze / of / the / welding / history
3. times / used / welding / in / blacksmiths / ancient / techniques.
4. welding / revolution. / industrial / significant / role / the / played / a / in
5. construction / today, / manufacturing. / is / essential / welding / and / in

2.3. Reading

Ex. 1. Read the text.

The History of Welding

The history of welding stretches back thousands of years, with the earliest evidence of welded artifacts dating back to the Bronze Age. The ancient Egyptians, for example, used a form of welding to join gold parts together as early as 3,000 BC.

However, it wasn't until the 19th century that welding really began to develop as a modern industrial process. In the early 1800s, Sir Humphry Davy, an English chemist, invented the first electric arc lamp. This device produced light by creating an electrical arc between two carbon electrodes. Although Davy didn't realize it at the time, this was the first recorded instance of the use of an electric arc for welding.

In the late 1800s, another Englishman, Charles L. Coffin, developed a practical method for arc welding using a metal electrode. This process was known as shielded metal arc welding (SMAW), and it quickly became popular for joining steel structures and machinery.

Over the next few decades, other types of welding were developed. In 1907, Oscar Kjellberg, a Swedish engineer, invented the coated electrode, which made SMAW more efficient and easier to use. In the 1930s, a Russian scientist named Konstantin Khrenov developed a new type of welding called gas metal arc welding (GMAW), or MIG welding. This process used a continuous wire electrode and an inert gas shield, and it quickly became the preferred method for welding aluminum and other non-ferrous metals.

During World War II, welding played a crucial role in the production of tanks, ships, and aircraft. After the war, the demand for welded products continued to grow, and

new welding processes and techniques were developed to meet this demand. In the 1950s, plasma arc welding (PAW) and electron beam welding (EBW) were invented, allowing for even higher-quality welds and greater precision.

Today, welding is used in a wide range of industries, from construction and manufacturing to aerospace and automotive. Modern welding techniques include laser welding, friction stir welding, and robotic welding, which uses computer-controlled machines to perform the welding process. As technology continues to advance, it's likely that new welding processes will be developed, making it an even more vital part of our industrial infrastructure.

Ex. 2. Choose the correct answer.

1. Which of the following statements best summarizes the historical development of welding described in the passage?

A. Welding has been used since ancient times, but it remained a primitive technique until the 19th century, when it began to evolve into a modern industrial process.

B. Welding has been used since the Bronze Age, and its development has been a steady, linear progression over the centuries.

C. Welding was first developed in the 19th century and has since undergone a series of rapid advancements, particularly during and after World War II.

D. The history of welding is characterized by the invention of specific welding techniques, each of which represented a significant breakthrough in the field.

2. According to the passage, what was the primary significance of the invention of the electric arc lamp by Sir Humphry Davy?

A. It led to the development of shielded metal arc welding (SMAW), a widely used welding technique.

B. It represented the first recorded instance of the use of an electric arc for welding, even though Davy did not recognize its potential.

C. It directly inspired the development of gas metal arc welding (GMAW), also known as MIG welding.

D. It was a crucial step towards the industrialization of welding, as it demonstrated the potential of electrical technology in the field.

3. The passage suggests that the development of various welding techniques, such as SMAW and GMAW, was driven primarily by:

- A. The need to improve the efficiency and ease of use of existing welding methods.
- B. The desire to find new applications for welding in specific industries, such as aerospace and automotive.
- C. The goal of achieving higher-quality welds and greater precision in the welding process.
- D. A combination of technological advancements and the growing demand for welded products in the industrial sector.

4. Which of the following best describes the role of welding during World War II, as discussed in the passage?

- A. Welding played a crucial role in the production of military equipment and vehicles, contributing to the war effort.
- B. Welding techniques were largely stagnant during the war years, as resources were diverted away from technological innovation.
- C. The war led to the development of new welding processes, such as plasma arc welding and electron beam welding.
- D. Welding became a more prominent industrial activity during the war, but it did not have a significant impact on the production of military hardware.

5. The passage suggests that the continued advancement of welding technology is likely to:

- A. Slow down or stagnate, as the field has reached the limits of its potential for innovation.
- B. Focus on the development of specialized welding techniques for niche applications, rather than broad, industry-wide improvements.
- C. Involve the integration of computer-controlled systems and automation, further enhancing the precision and efficiency of the welding process.

D. Prioritize the improvement of existing welding methods over the invention of entirely new welding processes.

6. Which of the following can be inferred about the historical significance of the welding techniques described in the passage?

A. The development of SMAW and GMAW represented major breakthroughs that fundamentally transformed the welding industry.

B. The invention of the coated electrode by Oscar Kjellberg was a more significant advancement than the development of GMAW.

C. The introduction of plasma arc welding and electron beam welding in the 1950s had a greater impact on the industry than the earlier welding innovations.

D. The historical progression of welding technology has been relatively linear, with each new technique building upon the previous ones.

7. Which of the following best characterizes the overall tone and perspective presented in the passage regarding the history of welding?

A. The passage adopts a critical, skeptical view of the development of welding, highlighting its limitations and shortcomings.

B. The passage takes a celebratory, optimistic stance, emphasizing the steady progress and transformative impact of welding technology.

C. The passage maintains an objective, factual tone, providing a balanced and impartial account of the historical evolution of welding.

D. The passage presents the history of welding as a narrative of innovation and advancement, with a focus on the key individuals and breakthroughs that shaped the field.

2.4. Communication

Ex. 1. Make sentences using the following words:

1. ever/wondered/origins
2. evolved/time/technologies
3. become/crucial/skill
4. think/continue/advance
5. Learning/history/fascinating