

Тема занятия: «Роль сварки в развитии новых технологий»

Цель занятия: выучить новый лексический материал по теме «Роль сварки в развитии новых технологий»; совершенствовать навыки чтения и перевода текста профессионального направления; систематизировать знания, ответив на контрольные вопросы по теме занятия.

Уважаемые студенты! Ознакомьтесь с материалами практического занятия на тему «Роль сварки в развитии новых технологий». Конспект занятия выполняйте **в рабочей тетради письменно, обязательно указывая дату занятия, тему занятия, номер упражнения.** Ответы предоставить преподавателю на проверку **до 01. 02. 2023 г.** в электронном виде (**фотоотчёт**) на e-mail mikagol2605@mail.ru. Телефон преподавателя для консультации и возникающих вопросов: 072-14-15-816.

С уважением, Голодюк Марина Викторовна.

- 1. Запишите новую лексику в словарь, выучите новую лексику.**
- 2. Прочитайте и устно переведите тексты «Shipbuilding» и «The Alaska Pipeline».**
- 3. Дайте письменно ответы на вопросы к текстам и выполните задания.**

Shipbuilding

Vocabulary:

war effort - военная экономика

riveting - клепка

brittle fracture - хрупкий излом

notch - зубец; вырез, паз, пропи́л, прорез

crack propagation - развитие трещин

The finest hours for U.S. shipbuilding were during World War II when 2710 Liberty ships, 531 Victory ships and 525 T-2 tankers were built for the war effort. Through 1945, some 5171 vessels of all types were constructed to American Bureau of Shipping (ABS) class during the Maritime Commission wartime shipbuilding program. At this time in shipbuilding history, welding was replacing riveting the main method of assembly.

The importance of welding was emphasized early in the war when President Roosevelt sent a letter to Prime Minister Winston Churchill, who is said to have read it aloud to the members of Britain's House of Commons.

The letter read in part, "Here there had been developed a welding technique which enables us to construct standard merchant ships with a speed unequalled in the history of merchant shipping."

The technique the President was referring to was undoubtedly submerged arc welding, which was capable of joining steel plate as much as 20 times faster than any other welding process at that time.

During this period of assimilation, eight Liberty ships were lost due to a problem called brittle fracture. At first, many blamed welding, but history would soon prove that the real cause of brittle fracture was steels that were notch sensitive at operating temperatures. The steel was found to have high sulfur and phosphorus contents. On more than 1400 ships, crack arrestors were used to prevent crack propagation. No crack was known to grow past 37 an arrestor. This safeguard helped reduce casualties from 140 to 20 per month.

Дайте письменно ответы на вопросы:

1. When were the finest hours for U.S. shipbuilding?
2. What was the technique referring by the President?
3. Why this technique was better than another welding process at that time?
4. What was the main reason of losing eight Liberty ships?

The Alaska Pipeline

Vocabulary:

fusion welding – сварка плавлением

field welding – сварка в полевых условиях, сварка при монтаже

toughness – твердость

planeload – полная загрузка самолета

X-ray inspection – рентгенодефектоскопия

induction heating – индукционный нагрев

Perhaps no single welding event in history ever received so much attention as did the Alaska Pipeline. Crews of seasoned welders braved Alaska's frigid terrain to weld this large-diameter pipeline, from start to finish. At one point, 17,000 people were working on the pipeline - 6% of the total population of Alaska. The entire pipeline only disturbed about 12 square miles of the 586,000 square miles of the state of Alaska.

Welders were called upon to handle and weld a new steel pipe thicker and larger than most of them had ever encountered before, using electrodes also new to most. And, the requirements were the stiffest they had ever seen.

The U.S. Department of the Interior and a new pipeline coordinating group representing the state of Alaska instituted some changes. So, the original specifications for **field welding** were tossed, replaced by much stiffer requirements for **weld toughness**. Instead of the conventional pipeline welding electrode planned originally for the bulk of field welding, the new requirements required higher quality. The only electrode the engineers could find that met the new requirements was an E8010-G filler metal from Germany, so it was soon flown over by the **planeload**. Some of the Pipeline Welders Union out of Tulsa, Okla., then welding in Alaska, had used this electrode while working on lines in the North Sea, but most welders were seeing it for the first time.

One of the requirements was 100% **X-ray inspection** of all welds. The films were processed automatically in vans that traveled alongside the welding crews.

Welders worked inside protective aluminum enclosures intended to protect the weld joint from the wind. Lighting inside the enclosures enabled welders to see what they were doing during Alaska's dark winter.

On the main pipeline, preheat and the heat between weld passes was applied at first by spider-ring burners. **Induction heating** was used later during construction.

Составьте план к тексту.