

Тема занятия: «Сварочные процессы»

Цель занятия: выучить новый лексический материал по теме «Сварочные процессы»; 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 «Сварочные процессы». Конспект занятия выполняйте **в рабочей тетради письменно, обязательно указывая дату занятия, тему занятия, номер упражнения.** Ответы предоставить преподавателю на проверку **до 29. 03. 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 текст «Introduction to Welding Processes & Equipment».
3. Дайте письменно ответы на вопросы к тексту.

Introduction to Welding Processes & Equipment

Vocabulary:

soldering – пайка; пайка мягким (легкоплавким) припоем
tinning – лужение; облуживание
leading – свинцевание
brazing – 1) пайка твердым припоем (из меди и цинка) 2) покрытие медью
sweat – паять, запаивать, припаивать (in, on)
gimmick – 1) сложное приспособление Syn: gadget 2) а)прием, трюк, уловка, ухищрение, хитрость
filler metal – присадочный металл, присадка
filler rod – присадочный пруток; присадочная проволока
heat buildup – теплообразование, тепловедение
heat distortion – деформация (материала) из-за теплового нагрева
stitch welding – прерывистая шовная сварка; точечная сварка перекрывающимися точками; автоматическая точечная сварка

Among the first things a new welder needs to understand, is what the different kinds of welding processes and equipment are, and their application.

A quick rundown:

Terms:

Soldering: Bonding by melting a soft metal to the surface of pieces to be joined. Low temperature. Good for joining dissimilar materials. Most common solders are lead-tin alloys.

Tinning: A soldering process, where the surface of a metal is coated with solder.

Leading: A form of soldering, solder is used to fill in the surface of metal.

Brazing: Similar to soldering, but uses a higher temperature to fuse the filler metal to the work pieces. Stronger bond. (Includes "Silver Soldering") Work heated to pre-melt temperatures.

Welding: Joining 2 similar work pieces by melting them together, usually with an additional filler rod of some sort to take up space. Materials must be similar.

Cutting: Work is heated to melting point and beyond, and "cut" by oxidizing metal. (Literally burning it away).

Shield: A barrier to keep oxygen away from heated work to prevent oxidation. Includes chemical coatings called flux (liquids, pastes, solids, which may be vaporized into a barrier gas when heated), and inert gasses. Oxidation of the surfaces will prevent proper bonding of the metals.

Gas Welding

Uses Flame from burning gas to create welding heat.

Propane torch: (Soldering, heating) Good for sweating pipes, starting fires, and spending hours trying to heat frozen bolts, while the surrounding metal gets just as hot.

Oxyacetylene torch: (Cutting, welding, brazing, soldering, leading) Most universal and useful welding tool. (Uses Acetylene gas and Oxygen for hot flame) With the right bits, rod, and technique, you can weld almost anything. Good for cutting anything from sheet metal to the turret off a tank, lead filling, brazing (a sort of hard soldering process)welding plate, welding sheet metal, welding aluminium, heating frozen bolts, or alternately cutting them off, drilling holes in plate, welding cast iron, shrinking and forming steel, and can double as a flame thrower in a pinch. Drawbacks are: Overheating of some types of work, harder to control quality of some processes.

Oxy-propane: (Soldering, brazing, heating) A cheap compromise between low cost and portable propane, and Oxy-Acetylene. Better than the former, not as good as the latter.

Arc welding

Uses an electric arc to create welding heat.

Basic AC & DC arc welders (AC is cheaper) Uses flux coated steel (or other) rods of various types for different jobs. Makes some of the best welds on heavy gauge steels and cast iron. Cutting rods can make clean holes through thick stock, and are about the only thing which can cut Kryptonite bike locks. Very difficult to weld thin metals. You can also get a **carbon arc torch** to use on an arc welder to braze.

Eastwood's "**stitch**" **welder** is a gimmick used on an arc welder to buzz the rod in and out, which may help on thinner stock. (learning how to weld better, or going to a different process is usually a better idea.)

MIG (Metal Inert Gas): A DC arc welding process which uses filler metal fed in the form of a spool of thin wire, shielded by flow of inert gas (He, Argon) instead of flux used in Arc. Very fast, much easier than Arc Welding, with less **heat buildup**. Very good for sheet metal, due to minimal **heat distortion**. Harder to weld thick stock, as welds are weaker due to poorer penetration. The modern choice for steel body work, it can also be used for Aluminum with Argon as the shield gas.

TIG (Tungsten Inert Gas): A high frequency AC arc process which uses a tungsten electrode shielded by an inert gas to create a fine, controllable torch. Uses a separate filler rod, as in Oxy-Acetylene welding. Capable of welding very thin metals. About the best process for Aluminum, Stainless steel, and other exotic stuff.

Resistance welding: includes **spot welding:** Uses the heat generated by electricity flowing through work to melt and fuse. i.e.- put an electrode on either side of 2 overlapped sheets of steel, turn on power. Metal in between heats up, and melts together. An old favorite for assembling car bodies.

Plasma Cutters: Not a welder, but related. A high voltage arc is used to superheat and ionize a stream of air to the "plasma" state. The stream of plasma makes a rapid, clean, narrow cut with minimal heating of the work piece.

Дайте письменно ответы на вопросы к тексту.

1. What is the main difference between soldering and brazing?
2. What is used by welders to prevent oxidation?
3. What makes soldering advantageous before welding?
4. What welding processes are suitable for welding thin/thick metal plates?
5. What makes plasma cutting better than gas cutting?