

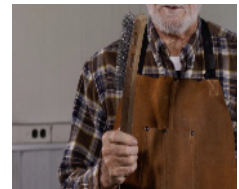
OVERVIEW

Arc welding is a welding process that utilizes an electric arc between an electrode and the workpiece to join metals together. It is a fusion welding technique where the heat generated by the electric arc melts the base metals and forms a molten pool.

In this module, we will provide you with a comprehensive step-by-step guide to using three different welding machines: the Lincoln Electric Pro 100, Lincoln Electric AC 225, and Lincoln Electric Power MIG 256. Each machine has its own unique features and welding processes. You will learn how to prioritize safety by using the necessary protective gear and preparing your work area properly. We will guide you through the process of checking and setting up the welding equipment, selecting the appropriate electrodes or wires, and adjusting the welding parameters. You will also learn how to clean and prepare the workpiece, put on your safety gear, and begin the welding process. Throughout the module, we emphasize the importance of monitoring the welding process, finishing the weld, and practicing post-welding cleanup.

SAFETY WEARS AND EQUIPMENT

1. Welding helmet or welding hood
2. Welding gloves
3. Welding jacket or leather coat
4. Slag hammer
5. Wire brush



Different types of welding machines for welding

1. Classic - Lincoln Electric ac 225
2. Lincoln Electric Power MIG 256
3. Lincoln Electric Pro 100 Wire Feed

A. CLASSIC - LINCOLN AC 225

- The Lincoln Electric AC 225 is a popular welding machine widely used in both professional and amateur welding applications. It is a stick welding machine that operates on alternating current (AC). The AC 225 is known for its simplicity and robustness. It offers a wide amperage range and is suitable for welding a variety of metals, including steel and cast iron. This machine is commonly used in construction, fabrication, and repair projects.

Equipment/tools used with the AC 225

1. Electrodes or welding rods and Electrode holder - Stick welding involves using a stick-shaped electrode made of steel. There are different types of welding electrodes identified by a four-digit number. The first two digits indicate strength, the following number indicates suitable welding positions, and the last digit represents the electrode's overall type. Note: Proper storage of electrodes is important. The function of the electrode holder is to hold and provide a secure connection for the electrode, allowing the welder to guide and control the welding process.

PROCEDURE

1. Prepare Your Work Area:

- Ensure you have a clean and well-ventilated work area. Remove any flammable materials and keep a fire extinguisher nearby. Also, make sure there are no combustible gases or liquids nearby.

2. Prepare Your Welding Equipment

- Check if the Lincoln Electric AC 225 is in good working condition. Inspect the power cord, electrode holder, and ground clamp for any signs of damage. Ensure that the machine is properly grounded.



Lincoln ac 225

Electrode holder

Electrode



3. Select the Electrode

- Choose the appropriate electrode for your welding project.
- Electrodes with different compositions are suited for different types of metals. Refer to the manufacturer's recommendations or consult a welding handbook for guidance.



Electrodes

4. Set Up the Lincoln Electric AC 225

- Plug in the AC 225 and ensure the power switch is in the "off" position. Connect the ground clamp securely to the workpiece or the welding table. Attach the electrode holder to the positive terminal.



Switch

5. Set the Welding Parameters

- The AC 225 is a simple stick welding machine. Set the welding parameters manually by adjusting the amperage on the machine. Refer to the electrode manufacturer's recommendations or consult a welding handbook for guidance on the appropriate amperage setting.

Note that the rod size and the thickness of your metal piece determines the amperage you are working with: The thinner the rod the lower the amperage



Amperage

6. Prepare the Workpiece

- Clean the surfaces to be welded using a wire brush or a grinder to remove rust, paint, or any contaminants. Ensure that the workpiece is securely positioned and clamped to prevent movement during welding.



Wire brush

7. Put on Your Safety Gear

- Put on your welding helmet, safety glasses or goggles, gloves, and protective clothing. Make sure your skin is not exposed to the welding arc or sparks.



8. Start Welding

- With the proper safety gear on, strike an arc by tapping the electrode against the workpiece and quickly pulling it back. Once the arc is established, maintain a consistent travel speed and angle to achieve a steady weld bead. Keep the electrode at the correct distance from the workpiece, which is typically around to $\frac{1}{4}$ inch.



9. Monitor the Welding Process

- Observe the weld pool and ensure it is properly penetrating the base metal. Make adjustments to the travel speed, angle, or amperage setting if needed to maintain the desired bead size and penetration. Continue welding along the desired joint, maintaining a steady and consistent motion.



10. Finishing the Weld

- Once you have completed the weld, release the electrode trigger and allow the arc to extinguish. Inspect the weld for any defects or irregularities. If necessary, use a wire brush or grinder to clean up the weld bead and remove any slag.

13. Post-Welding Cleanup

- Allow the welded joint to cool down before handling. Clean up your work area, store your equipment properly, and make sure to dispose of any waste or used electrodes safely.

B. LINCOLN ELECTRIC POWER MIG 256

- The Lincoln Electric Power MIG 256 is a versatile and powerful welding machine that supports multiple welding processes. It is used for metal inert gas (MIG) welding.

PARTS

1. Wire
2. Gas cylinder
3. Electrode handle

PROCEDURE

1. Prepare Your Work Area

- Ensure you have a clean and well-ventilated work area. Remove any flammable materials and keep a fire extinguisher nearby. Also, make sure there are no combustible gases or liquids nearby.



2. Prepare Your Welding Equipment

- Check if the Lincoln Electric Power MIG 256 is in good working condition. Inspect the power cord, welding gun, and ground clamp for any signs of damage. Ensure that the machine is properly grounded.

3. Select the Welding Process and Wire

- The Power MIG 256 supports multiple welding processes, including MIG, and Flux-Cored. Choose the desired process based on your project requirements. Select the appropriate welding wire for your application, considering the metal type and thickness.



4. Set Up the Power MIG 256

- Plug in the Power MIG 256 and ensure the power switch is in the “off” position. Connect the ground clamp securely to the workpiece or the welding table. Attach the welding gun to the machine’s front panel.



5. Set the Welding Parameters

- The Power MIG 256 features digital controls for precise parameter adjustment. Consult the welding parameter chart provided by Lincoln Electric or refer to the wire manufacturer’s recommendations. Set the appropriate voltage, wire feed speed, and other parameters based on the wire diameter and material thickness.



6. Prepare the Workpiece

- Clean the surfaces to be welded using a wire brush or a grinder to remove rust, paint, or any contaminants. Ensure that the workpiece is securely positioned and clamped to prevent movement during welding.



7. Put on Your Safety Gear

- Put on your welding helmet, safety glasses or goggles, gloves, and protective clothing. Make sure your skin is not exposed to the welding arc or sparks.



8. Start Welding

- With the proper safety gear on, position the welding gun nozzle close to the workpiece and align it at the correct angle. Depress the trigger on the welding gun to start the arc. Maintain a steady travel speed and a consistent distance between the gun nozzle and the workpiece.



9. Monitor the Welding Process

- Observe the weld pool and ensure it is properly penetrating the base metal. Adjust the travel speed, voltage, or wire feed speed as needed to achieve the desired weld bead size and penetration. Pay attention to the welding gun angle and maintain a uniform motion along the joint.



10. Finishing the Weld

- Once you have completed the weld, release the welding gun trigger to stop the arc. Inspect the weld for any defects or irregularities. If necessary, use a wire brush or grinder to clean up the weld bead and remove any slag.



11. Post-Welding Cleanup

- Allow the welded joint to cool down before handling. Clean up your work area, store your equipment properly, and make sure to dispose of any waste or used electrodes safely.

- Remember: This step-by-step guide provides a general overview of the welding process with the Lincoln Electric Power MIG 256. It's essential to consult the user manual and follow all safety guidelines provided by Lincoln Electric for this specific welding machine.



C. LINCOLN ELECTRIC PRO 100

- The Lincoln Electric Pro 100 is a welding machine that is commonly used for light to medium-duty welding tasks. It is known for its ease of use and straightforward operation. The Pro 100 is designed for welding, also known as shielded metal arc welding (SMAW). It features adjustable welding parameters, allowing users to control the current and wire speed. This machine is suitable for various applications, including repairs, maintenance, and hobby projects.

EQUIPMENT USED WITH THE PRO 100

1. Wire (Shielded)
2. Electrode holder

PROCEDURE

1. Prepare Your Work Area:

- Ensure you have a clean and well-ventilated work area. Remove any flammable materials and keep a fire extinguisher nearby. Also, make sure there are no combustible gases or liquids nearby.



2. Prepare Your Welding Equipment:

- Check if the Lincoln Electric Pro 100 is in good working condition. Inspect the power cord, electrode holder, and ground clamp for any signs of damage. Ensure that the machine is properly grounded.



4. Set the Welding Parameters:

- Consult the welding parameter chart provided by Lincoln Electric or refer to the electrode manufacturer's recommendations. Adjust the current and wire speed knobs on the Pro 100 according to the electrode diameter and material thickness.



5. Prepare the Workpiece:

- Clean the surfaces to be welded using a wire brush or a grinder to remove rust, paint, or any contaminants. Ensure that the workpiece is securely positioned and clamped to prevent movement during welding.



6. Put on Your Safety Gear:

- Put on your welding helmet, safety glasses or goggles, gloves, and protective clothing. Make sure your skin is not exposed to the welding arc or sparks.



8. Monitor the Welding Process:

- Observe the weld pool and ensure it is properly penetrating the base metal. Make adjustments to the travel speed, angle, or heat settings if needed to maintain the desired bead size and penetration. Continue welding along the desired joint, maintaining a steady and consistent motion.



9. Finishing the Weld:

- Once you have completed the weld, use a wire brush or grinder to clean up the weld bead and remove any slag. Also, release the electrode trigger and allow the arc to extinguish. Inspect the weld for any defects or irregularities. If necessary,



10. Post-Welding Cleanup:

- Allow the welded joint to cool down before handling. Clean up your work area, store your equipment properly, and make sure to dispose of any waste or used electrodes safely. Remember, this step-by-step guide is a general overview, and it's essential to consult the user manual and follow all safety guidelines provided by Lincoln Electric for the Pro 100 welding machine.

