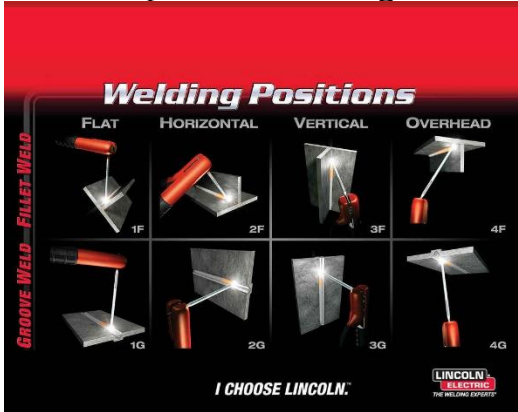


## THE SHIELDING GAS

### 10.1. Vocabulary

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

|                                                                                     |                                                                                             |
|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|
| 1. out-of-position welding                                                          | a. the process of joining pipes together using welding techniques.                          |
|    |                                                                                             |
| 2. overhead welding                                                                 | b. the process of welding in a horizontal position with the weld bead deposited from above. |
| 3. plain                                                                            | c. the depth to which a weld extends into the base metal.                                   |
| 4. penetration                                                                      | d. welding performed in a position other than flat, horizontal, or vertical.                |
| 5. pipe welding                                                                     | e. a simple and unadorned surface or object without decoration.                             |
|  |                                                                                             |
| 6. ferrous material                                                                 | f. metal containing iron, such as steel or cast iron.                                       |

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

**Out-of-position, plain, Overhead, ferrous material, penetration, Pipe**

The welder used \_\_\_\_\_(1) for the project to ensure durability and strength.

The technician selected a \_\_\_\_\_(2) shielding gas to prevent contamination during welding.

The \_\_\_\_\_(3) of the shielding gas was crucial for achieving high-quality welds.

\_\_\_\_\_(4) welding requires precise control of shielding gas to prevent defects.

\_\_\_\_\_(5) welding can be challenging due to shielding gas distribution issues.

\_\_\_\_\_(6) welding demands careful selection of shielding gas to maintain proper weld integrity.

## **10.2. Reading**

*Ex. 1. Read the text.*

### **Shielding Gas**

When it comes to welding, the right shielding gas can make all the difference. Shielding gases are used in the welding process to protect the weld area from atmospheric gases like oxygen and nitrogen. These gases can cause defects in the weld, such as porosity and brittleness, so it's important to choose the right shielding gas for the job.

There are several types of shielding gases commonly used in welding, each with its own advantages and disadvantages. The most common type is argon, which is often used for TIG (tungsten inert gas) welding. Argon provides good arc stability and produces a clean, smooth weld. It's also relatively inexpensive and readily available. However, argon is not suitable for all applications, as it does not provide enough heat for certain types of metals.

Another common shielding gas is carbon dioxide, which is often used for MIG (metal inert gas) welding. Carbon dioxide provides excellent penetration and is ideal for welding thick materials. It's also less expensive than argon, making it a popular choice for many welders.

However, carbon dioxide can produce a rougher weld and may require more post-weld cleanup.

For certain types of metals, such as stainless steel and aluminum, a mixture of argon and carbon dioxide is often used. This combination provides the benefits of both gases, producing a clean weld with good penetration. The exact ratio of argon to carbon dioxide will depend on the specific application.

In addition to argon and carbon dioxide, there are other specialty shielding gases available. For example, helium can be used to increase heat input and improve weld speed. Hydrogen can be added to some gases to help remove impurities and increase penetration. Nitrogen can be used as a shielding gas for certain types of stainless steel.

Choosing the right shielding gas for a particular welding job requires careful consideration of factors such as the type of metal being welded, the thickness of the material, and the desired appearance of the weld. It's also important to use the correct flow rate and nozzle size to ensure proper coverage and protection. By selecting the appropriate shielding gas and following best practices, welders can achieve high-quality results and avoid common defects.

*Ex. 2. Answer the questions.*

1. What is the purpose of shielding gases in welding?
2. How do atmospheric gases like oxygen and nitrogen affect the weld area?
3. What are the advantages of using argon as a shielding gas for TIG welding?
4. Why is carbon dioxide commonly used as a shielding gas for MIG welding?
5. When is a mixture of argon and carbon dioxide preferred for welding certain metals?
6. How can helium be beneficial in welding when used as a shielding gas?

7. What factors should be considered when choosing the right shielding gas for a welding job?

### **10.3. Communication**

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

protects/weld/contamination

Welders/commonly/argon

important/shielding/gas

metal/determines/appropriate

prevents/oxidation/welding

welders/prefer/carbon

ventilation/necessary/shielding

enhances/quality/weld

replace/shielding/gas

explain/role/shielding