

MECHANICAL AND CHEMICAL PROPERTIES OF ALUMINIUM

8.1. Vocabulary

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

1. conductivity	a. избегать
2. conductor	b. обработка
3. bend	c. стигб
4. acid environment	d. убывание
5. avoid	e. проводимость
6. decrease	f. кислая среда
7. damage	g. вред
8. machining	h. провод

Ex. 2. Match the words with their definitions.

1. weight	a. able to last a long time without breaking or wearing out.
2. wide	b. thin, shiny metal sheet used for wrapping food or covering dishes.
3. layer	c. the act of making something larger in amount or size.
4. durable	d. a single thickness of material covering a surface or forming part of a structure.
5. recycle	e. the process of collecting and reusing materials to make new products.
6. oxygen 	f. having a large distance from one side to the other.
7. increase	g. the heaviness of an object or person.
8. exploit	h. a gas that is necessary for humans and animals to breathe.
9. foil	i. to use something fully for your own advantage.

Ex. 3. Complete the sentences with the given words.

oxygen, acid environment, bend, exploit, welded joint, durable, damage, Conductivity, decrease, layers, recycle, foil, avoid

The _____(1) can affect the quality of welding joints.

To produce a strong bond, welders should _____(2) impurities in the materials.

A _____(3) in the metal can weaken the structure of a welded joint.

_____(4) is important for ensuring proper heat distribution during welding.

Multiple _____(5) of metal create a stronger weld.

Shielding gases help prevent _____(6) from affecting the welding process.

It's essential to _____(7) scrap metal produced during welding projects.

The weight of the material can impact the strength of the _____(8).

Excessive heat can cause _____(9) to the metal being welded.

The _____(10) in temperature led to difficulties in completing the weld.

Welders need _____(11) equipment to handle the demands of their work.

Welders often _____(12) different techniques to achieve the desired results.

Aluminum _____(13) can be used to protect certain areas during welding.

8.2. Word Formation

Ex. 1. Change the form of the verbs to complete the questions.

1. After he lost his job, he became completely _____ (money).
2. Her _____ (care) behavior caused many accidents.
3. The new technology allowed for _____ (wire) connections.
4. He felt _____ (hope) after failing the exam.
5. The broken tool was _____ (use) and needed to be replaced.
6. The modern design featured a _____ (weld) joint.

8.3. Reading

Ex. 1. Read the text.

MECHANICAL AND CHEMICAL PROPERTIES OF ALUMINIUM

Aluminum is a versatile metal known for its unique combination of mechanical and chemical properties. It is lightweight, with a density about one-third that of steel, making it ideal for various applications, including transportation and construction. Aluminum also boasts a high strength-to-weight ratio, meaning it can bear significant loads while remaining relatively light.

Mechanically, aluminum is highly malleable and ductile. These properties allow it to be easily shaped into sheets, foils, and intricate forms without breaking. It also exhibits good corrosion resistance due to the formation of a thin, protective oxide layer on its surface. This makes aluminum particularly useful in environments exposed to moisture and other corrosive elements.

Chemically, aluminum is reactive but forms a stable layer of aluminum oxide when exposed to air, which prevents further oxidation. This protective quality is one of the reasons why aluminum doesn't rust like iron. It can also be alloyed with other metals, such as copper, manganese, and silicon, to enhance its strength and durability while retaining its desirable attributes.

In summary, aluminum's excellent mechanical properties, combined with its chemical stability, make it a valuable material in many industries today.

Ex. 2. Answer the questions.

1. What are some applications of aluminum due to its lightweight nature?
2. How does the high strength-to-weight ratio of aluminum benefit its use in various industries?
3. What mechanical properties make aluminum easy to shape without breaking?
4. Why is aluminum considered useful in environments exposed to moisture and corrosive elements?
5. How does aluminum prevent further oxidation when exposed to air?
6. What are some metals that can be alloyed with aluminum to enhance its strength and durability?
7. Why is aluminum considered a valuable material in many industries today?

8.4. Communication

Ex. 1. Make questions using the following words.

1. common/uses/aluminum
2. strength/compare/steel
3. process/recycling/products
4. considered/lightweight/construction
5. effects/corrosion/surfaces
6. test/hardness/alloy
7. advantages/using/cooking
8. ductility/affect/formability
9. describe/conductivity/electrical
10. popular/choice/packaging