

MECHANICAL AND CHEMICAL PROPERTIES OF STAINLESS STEEL

Glossary:

- austenitic — аустенитная сталь (немагнитная, устойчивая к коррозии)
- coil — катушка, пружина
- cutlery — столовые приборы
- definition — определение
- ferritic — ферритная сталь (магнитная, менее коррозионностойкая)
- household — бытовая техника, предметы домашнего обихода
- invent — изобретение, разработка
- martensitic — мартенситная сталь (закалённая, твёрдая, хрупкая)
- nitrogen — азот (используется для улучшения свойств сталей)
- nuclear — ядерный (связанный с атомной энергией)
- parlance — терминология, профессиональный жаргон
- precipitation — осаждение (процесс выделения фаз в сплавах)
- prevent — предотвращение, защита
- stain — пятно, загрязнение
- surgical — хирургический инструмент
- utensils — принадлежности, инструменты

7.1. Vocabulary

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

1. nuclear	a. аустенитный
2. nitrogen	b. хирургический
3. prevent	c. пятно
4. parlance	d. состав

5. stain	е. азот
6. austenitic	ф. определение
7. coil	г. змеевик
8. utensils	h. украшение
9. decoration	i. ядерный
10. cutlery	j. предотвращать
11. martensitic	к. манера речи
12. definition	l. утварь
13. invent	м. столовые приборы
14. composition	н. ферритный
15. silicone	о. кремний
16. surgical	р. изобретать
17. ferritic	q. мартеновский

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

silicone, parlance, surgical, decoration, martensitic, utensils, nitrogen, definition, stain, prevent, cutlery, composition, nuclear, ferritic, invent, coil, austenitic

_____ (1) stainless steel is commonly used for welding applications.

The _____ (2) was used in the welding machine to feed the wire smoothly.

Make sure to clean your _____ (3) after welding to remove any residue.

It is important to understand the _____ (4) of different welding techniques.

The _____ (5) of the metal determines its strength in welding projects.

She added _____ (6) to the welded piece to make it more visually appealing.

Some welding processes require the use of _____ (7) for specific purposes.

_____ (8) steel is known for its magnetic properties in welding applications.

Engineers _____(9) new welding technologies to improve efficiency.

_____(10) steel is often chosen for its hardness in welding projects.

During welding, _____(11) can be used as a shielding gas.

_____(12) welding involves specialized techniques due to safety concerns.

In welding _____(13), a "bead" refers to the deposited filler material.

Proper safety measures can help _____(14) accidents during welding.

Welding can sometimes leave a _____(15) on the surface that needs to be cleaned.

_____(16) instruments must undergo precise welding to ensure sterility.

Welding _____(17) such as clamps and hammers are essential for the process.

7.2. Reading

Ex. 1. Read the text.

MECHANICAL AND CHEMICAL PROPERTIES OF STAINLESS STEEL

Stainless steel is known for its exceptional mechanical and chemical properties, making it a reliable material in various industries. Mechanically, it boasts high tensile strength and durability, allowing it to withstand heavy loads and pressures without deforming. This strength is due to the addition of elements like chromium and nickel, which enhance its overall stability.

Chemically, stainless steel is known for its remarkable resistance to corrosion and staining. The presence of chromium sets up a passive layer on the surface, protecting it from rust and other environmental factors.

This makes stainless steel an excellent choice for applications in harsh environments, such as marine or chemical industries.

Moreover, stainless steel maintains its properties across a wide temperature range, which means it won't easily become brittle in the cold or weaken in extreme heat. This versatility makes it a popular material in fields ranging from construction to medical instruments.

Its aesthetic qualities shouldn't be overlooked either; the shiny, polished look of stainless steel is not only strong but also visually appealing, often used in architecture and consumer products. Thus, the balanced combination of mechanical and chemical properties makes stainless steel a fascinating and useful material.

Ex.2 Choose the correct answer from the text:

1. What gives stainless steel its exceptional mechanical properties?

- A) Its ability to resist temperatures
- B) High tensile strength and durability
- C) Chromium's color enhancement
- D) Nickel's magnetic properties

2. Which element contributes significantly to stainless steel's resistance against corrosion?

- A) Iron
- B) Carbon
- C) Chromium
- D) Manganese

3. Why does stainless steel remain stable over a broad temperature range?

- A) It contains insulating materials
- B) It doesn't lose its strength at low temperatures

- C) It becomes more flexible when heated

- D) Both B and C

4. In what type of industry would you find stainless steel being widely utilized because of its corrosion resistance?

- A) Fashion design

- B) Marine engineering

- C) Woodworking

- D) Textile manufacturing

5. Besides its functional advantages, why else might someone choose stainless steel for architectural purposes?

- A) For its lightweight nature

- B) Due to its bright, polished appearance

- C) Because it's cheaper than aluminum

- D) To reduce maintenance costs

Communication:

Ex.1 Find the correct translation of the following English sentences:

1. Durability and strength make this product last longer.	a. Использование нержавеющей стали обеспечивает ряд преимуществ в процессе производства.
2. Many modern kitchen appliances are made of stainless steel.	b. Нержавеющую сталь широко применяют как в строительстве, так и в автомобильной промышленности.
3. This coating resists corrosion and keeps surfaces clean.	c. Прочность и надежность делают этот продукт
4. Different steels have varying mechanical properties.	
5. Good chemical properties mean	

that the material is highly resistant.

6. Stainless steel is commonly used in both construction and automotive industries.

7. Adding a higher percentage of chromium improves corrosion resistance.

8. Using stainless steel offers several advantages during manufacturing processes.

9. Regular tests help verify the mechanical properties of materials.

10. Stainless steel remains one of the most popular materials for making tools and equipment.

долговечнее.

d. Повышение содержания хрома улучшает устойчивость к коррозии.

e. Этот материал устойчив к коррозии и сохраняет поверхности чистыми.

f. Регулярные испытания помогают подтвердить механические характеристики материалов.

g. Хорошие химические свойства означают высокую стойкость материала.

h. Нержавеющая сталь остаётся одним из наиболее популярных материалов для изготовления инструментов и оборудования.

i. Различные марки стали обладают разными механическими свойствами.

j. Многие современные бытовые кухонные приборы изготовлены из нержавеющей стали.