

ОЦЕНОЧНЫЕ СРЕДСТВА

ОГСЭ.02 Иностранный язык в профессиональной деятельности

образовательной программы по специальности

19.02.11 Технология продуктов питания из растительного сырья
базовой подготовки

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Введение

В соответствии с Федеральными государственными образовательными стандартами среднего профессионального образования для аттестации обучающихся на соответствие их персональных достижений поэтапным требованиям основной профессиональной образовательной программы (текущая и промежуточная аттестация) создаются оценочные средства, позволяющие оценить знания, умения и освоенные компетенции. оценочные средства являются неотъемлемой частью нормативно-методического обеспечения системы оценки качества освоения студентами образовательной программы среднего профессионального образования и обеспечивает повышение качества образовательного процесса техникума и результатов освоения образовательной программы.

Оценочные средства по учебной дисциплине ОГСЭ.02 Иностранный язык в профессиональной деятельности применяются для оценивания знаний и умений обучающихся. Структурными элементами являются: паспорт, характеризующий области применения, описание системы контроля и оценки освоения программы учебной дисциплины, в которой указываются организация текущего контроля успеваемости, промежуточной аттестации по итогам освоения учебной дисциплины, а также приложения, в которых представлены примерные оценочные средства, обеспечивающие проведение текущей и промежуточной аттестации по учебной дисциплине.

1. Паспорт

1.1. Область применения

Оценочные средства предназначены для проверки результатов освоения умений и усвоения знаний по учебной дисциплине ОГСЭ.02 Иностранный язык в профессиональной деятельности по специальности 19.02.11 Технология продуктов питания из растительного сырья

Оценочные средства позволяют оценивать:

1. Формирование элементов общих компетенций (ОК) и профессиональных компетенций (ПК):

Код ПК, ОК	Код умений	Умения	Код знаний	Знания
ОК 01	Уо 01.01	распознавать задачу и/или проблему в профессиональном и/или социальном контексте	Зо 01.01	актуальный профессиональный и социальный контекст, в котором приходится работать и жить;
	Уо 01.04	выявлять и эффективно искать информацию, необходимую для решения задачи и/или проблемы	Зо 01.02	основные источники информации и ресурсы для решения задач и проблем в профессиональном и/или социальном контексте;
ОК 02	Уо 02.01	определять задачи для поиска информации	Зо 02.01	номенклатура информационных источников, применяемых в профессиональной деятельности;
	Уо 02.02	определять необходимые источники информации	Зо 02.02	приемы структурирования информации
	Уо 02.04	выделять наиболее значимое в перечне информации	Зо 02.04	порядок их применения и программное обеспечение в профессиональной деятельности в том числе с использованием цифровых средств

	Уо 02.05	оценивать практическую значимость результатов поиска	Зо 02.04	порядок их применения и программное обеспечение в профессиональной деятельности в том числе с использованием цифровых средств
ОК 05	Уо 05.01	грамотно излагать свои мысли и оформлять документы по профессиональной тематике на государственном языке, проявлять толерантность в рабочем коллективе	Зо 05.02	правила оформления документов и построения устных сообщений
ОК 06	Уо 06.01	описывать значимость своей <i>специальности</i> ;	Зо 06.02	значимость профессиональной деятельности по профессии (специальности)
ОК 09	Уо 09.01	понимать общий смысл четко произнесенных высказываний на известные темы (профессиональные и бытовые), понимать тексты на базовые профессиональные темы;	Зо 09.01	правила построения простых и сложных предложений на профессиональные темы
	Уо 09.02	участвовать в диалогах на знакомые общие и профессиональные темы;	Зо 09.02	основные общеупотребительные глаголы (бытовая и профессиональная лексика)
	Уо 09.03	троить простые высказывания о себе и о своей профессиональной деятельности;	Зо 09.03	лексический минимум, относящийся к описанию предметов, средств и процессов профессиональной деятельности
	Уо 09.04	кратко обосновывать и объяснять свои	Зо 09.03 Зо 09.04	лексический минимум, относящийся к

		действия (текущие и планируемые);		описанию предметов, средств и процессов профессиональной деятельности особенности произношения
	Уо 09.05	писать простые связные сообщения на знакомые или интересующие профессиональные темы.	Зо 09.05	правила чтения текстов профессиональной направленности

1.2 Система контроля и оценки результатов освоения умений и усвоения знаний

В соответствии с учебным планом по дисциплине ОГСЭ.02 Иностранный язык в профессиональной деятельности предусмотрен текущий контроль умений и знаний с выставлением итоговой оценки за весь курс или текущий контроль во время проведения занятий, промежуточная аттестация в форме дифференцированного зачета с выставлением итоговой оценки за весь курс.

1.2.1 Формы промежуточной аттестации по ОП при освоении учебной дисциплины ОГСЭ.02 Иностранный язык в профессиональной деятельности

Учебная дисциплина	Формы промежуточной аттестации
ОГСЭ.02 Иностранный язык в профессиональной деятельности	дифференцированный зачет

1.2.2. Организация текущего контроля успеваемости, промежуточной аттестации по итогам освоения программы учебной дисциплины

Текущий контроль результатов обучения осуществляется в устной и письменной формах на учебных занятиях. Контролируются сформированные умения и навыки в 4 видах деятельности: чтение, аудирование, говорение и письмо по каждой теме рабочей программы. Задания представлены в форме текстов, аудиотекстов и разработанных к ним упражнений. Промежуточный контроль осуществляется на дифференцированном зачете. Дифференцированный зачет проводится в виде выполнения практических заданий по материалу профессиональной направленности. Итоговая оценка по дисциплине выставляется на основании текущих оценок по всему курсу и результатов сдачи дифференцированного зачета.

2. Задания для контроля и оценки освоения программы учебной дисциплины

2.1 Задания для текущего контроля

Text 1. The Urals — the Centre of Russian Metal Industry

1. Read and translate the text.

The Urals — a borderline between Europe and Asia — are a mountain chain which appeared many years ago as a result of tectonic activity. As time went on, the mountains were being destroyed by the action of water, sun and air. As a result, the highest mountains are only one thousand meters high. One more consequence is that the greatest deposits of ores came to the surface of the Earth. The fact that they were easily accessible stimulated the development of plants.

The Ural mining industries began during the time of Peter the First. In the 18th century the Urals, with their high quality ores and rich forests (a fuel for plants) played the greatest role in the world industry. Russia exported metal even to Great Britain.

The modernization of the Ural industry began with Magnitogorsk plant, built near the mountain Magnitnaya, rich in metallic ores. Later, many engineering plants were built in the region. The greatest plants are situated in Magnitogorsk, Nizhniy Tagil, Chelyabinsk and Novotroitsk.

At the beginning of the 20th century the Ural metal industry suffered a crisis because of the shortage of coal. But the delivery of coal from Kuzbass solved the problem.

It must be mentioned that about 70 metals and minerals were first discovered in the Ural mountains. Large deposits of iron, copper, lead, zinc, nickel, titanium, wolfram and many other metals characterize the region.

Nowadays some of the deposits are exhausted, and the plants work on the ores from the new layers (Kazakhstan, Siberia). But nevertheless, the Urals are the region with great history, traditions and experience, and hopefully it will have new stages of development.

2. Answer the following questions to the text.

1. Where are the Urals situated?
2. Why are the deposits of ores easily accessible?
3. When did the Ural mining industries begin? Did Russia export metal at that time?
4. Where did the modernization of the Ural industry begin?
5. What was the reason for the crisis for the Ural metal industry?
6. How many metals and minerals were first discovered in the Urals?
7. What are the recent problems of the Urals?
8. Does the author of the text hope that the region will have new stages of development? And what do you think?

3. Complete the following statements.

1. The Urals are a mountain change which ...
2. Mountains were being destroyed, and now the highest mountains ...
3. In the 18th century the Urals ...
4. The modernisation of the Ural industry began ...
5. The greatest plants are situated ...
6. At the beginning of the 20th century the Ural metal industry ...
7. About 70 metals and minerals ...
8. Nowadays some of the deposits are ...

Text 2. Some Words about Metallurgy

1. Read and translate the text

Some Words about Metallurgy

Metallurgy is one of the oldest of arts but one of the youngest of sciences. Many of our metals were known in ancient times, but it is only within the last century or two that the knowledge of the properties of the metals has made it possible to apply them in any extended way for industrial purposes.

With the development of physics of metals, metallography, theory of heat treatment, and other phases of the science of metals, the field of metallurgy has broadened.

Metallurgy in this broader sense falls into three divisions: chemical or extractive, physical and mechanical. Chemical metallurgy includes the metallurgical processes involving chemical change and the methods of production and refining.

Physical metallurgy deals with the nature, structure, and physical properties of metals and alloys.

Mechanical metallurgy includes the processes of working and shaping metals — processes which do not involve chemical changes.

2. Are these statements true or false?

- 1) Metallurgy as a science was known in ancient times.
- 2) There are three branches of metallurgy: chemical, physical and mechanical.
- 3) Physical metallurgy focuses on the nature, structure, and physical properties of metals and alloys.

3. Find in the text the English equivalents of these Russian word combinations.

- 1) в промышленных целях
- 2) применять
- 3) метод производства
- 4) очищение от примесей, улучшение качества
- 5) свойства металлов
- 6) теория термической обработки
- 7) в широком смысле
- 8) химическое изменение
- 9) включать
- 10) сплавы
- 11) обработка
- 12) извлекать

Text 3. Metals

1. Read the text

Metals are materials most widely used in industry because of their properties. The study of the production and properties of metals is known as **metallurgy**.

The separation between the atoms in metals is small, so most metals are dense. The atoms are arranged regularly and can slide over each other. That is why metals are malleable (can be deformed and bent without fracture) and ductile (can be drawn into wire). Metals vary greatly in their properties. For example, lead is soft and can be bent by hand, while iron can only be worked by hammering at red heat.

The regular arrangement of atoms in metals gives them a crystalline structure. Irregular crystals are called **grains**. The properties of the metals depend on the size, shape,

orientation, and composition of these grains. In general, a metal with small grains will be harder and stronger than one with coarse grains.

Heat treatment controls the nature of the grains and their size in the metal. Small amounts of other metals (less than 1 per cent) are often added to a pure metal. This is called **alloying** and it changes the grain structure and properties of metals.

All metals can be formed by drawing, rolling, hammering and extrusion, but some require hot-working. Metals are subject to metal fatigue and to creep (the slow increase in length under stress) causing deformation and failure. Both effects are taken into account by engineers when designing, for example, airplanes, gas-turbines, and pressure vessels for high-temperature chemical processes. Metals can be worked using machine-tools.

The ways of working a metal depend on its properties. Many metals can be melted and cast in moulds, but special conditions are required for metals that react with air.

2. Answer the questions

- 1) What are metals?
- 2) Why are most metals dense?
- 3) Why are metals malleable?
- 4) What is malleability?
- 5) What are grains?
- 6) What is alloying?
- 7) What is crystalline structure?
- 8) What do the properties of metals depend on?
- 9) What changes the size of grains in metals?
- 10) What are the main processes of metal forming?
- 11) How are metals worked?
- 12) What is creeping?

3. Find the following words and word-combinations in the text

- 1) свойства металлов
- 2) расстояние между атомами
- 3) правильное расположение
- 4) сильно отличаются по своим свойствам
- 5) кристаллическая структура
- 6) размер зерен
- 7) форма зерен
- 8) волочение
- 9) прокатка
- 10) ковка

- 11) экструзия
- 12) структура и свойства зерна
- 13) горячая обработка
- 14) усталость металла
- 15) ползучесть металла
- 16) плавка и отливка в формы
- 17) способы обработки металлов

4. Explain in English the meaning of the following words

- 1) malleability
- 2) crystalline structure
- 3) grains
- 4) heat treatment
- 5) alloying
- 6) creep

5. Translate into English

- 1) Металлы - плотные материалы, потому что между атомами в металлах малое расстояние.
- 2) Металлы имеют кристаллическую структуру из-за правильного расположения атомов.
- 3) Чем меньше зерна, тем твёрже металл.
- 4) Легирование изменяет структуру зёрен и свойства металлов.
- 5) Металл деформируется и разрушается из-за усталости и ползучести.

Text 4. Ferrous and Non-Ferrous Metals

Watch this video (The Difference Between Ferrous and Non-Ferrous Metals | Metal Supermarkets) Посмотрите видео и выполните задания.

https://www.youtube.com/watch?v=JIX_vFh5lIA&ab_channel=MetalSupermarkets

1. True or false.

- 1) Wrought iron does not contain iron.
- 2) Non-ferrous metals are used in wiring application.
- 3) Stainless steel is a non-ferrous metal, because it is corrosion resistant.
- 4) The iron production started in the Iron Age.
- 5) Wrought iron isn't corrosion resistant.

- 6) Ferrous metals are magnetic.
- 7) Lead is malleable.
- 8) Non-ferrous metals have a higher resistance to corrosion.
- 9) Alloy steels possess tensile strength and durability.

2.Translate into English.

- 1) Содержать железо
- 2) Производство железа
- 3) Легированная сталь
- 4) Углеродистая сталь
- 5) Кованое железо
- 6) Прочность при растяжении
- 7) Долговечность
- 8) Подвержен ржавлению
- 9) Электрооборудование
- 10) Драгоценные металлы
- 11) Пластичность, ковкость
- 12) Электропроводка
- 13) Коррозионная устойчивость

3.What is this video about? Speak about it.

Text 5. Steel

1. Read and translate the text

The most important metal in industry is iron and its **alloy** — steel. Steel is an alloy of iron and carbon. It is strong and **stiff**, but **corrodes** easily through **rusting**, although **stainless** and other special steels **resist** corrosion. The amount of carbon in a steel influences its properties **considerably**. Steels of low carbon **content** (mild steels) are quite ductile and are used in the manufacture of sheet iron, wire, and pipes. Medium-carbon steels containing from 0.2 to 0.4 per cent carbon are **tougher** and stronger and are used as structural steels. Both mild and medium-carbon steels are suitable for forging and **welding**. High-carbon steels contain from 0.4 to 1.5 per cent carbon, are hard and **brittle** and are used in **cutting tools**, **surgical instruments**, razor **blades** and **springs**. Tool steel, also called silver steel, contains about 1 per cent carbon and is strengthened and toughened by quenching and tempering.

The **inclusion** of other elements **affects** the properties of the steel. **Manganese** gives extra strength and toughness. Steel containing 4 per cent **silicon** is used for transformer **cores** or electromagnets because it has large grains acting like small magnets. The addition of chromium gives extra strength and corrosion resistance, so we can get **rust-proof** steels. Heating in the presence of carbon **or nitrogen-rich** materials is used to form a hard surface on steel (case-hardening). High-speed steels, which are extremely important in machine-tools, contain chromium and **tungsten** plus smaller amounts of vanadium, molybdenum and other metals.

2. Answer the questions

1. What is steel?
2. What are the main properties of steel?
3. What are the drawbacks of steel?
4. What kinds of steel do you know? Where are they used?
5. What gives the addition of manganese, silicon and chromium to steel?
6. What can be made of mild steels (medium-carbon steels, high-carbon steels)?
7. What kind of steels can be forged and welded?
8. How can we get rust-proof (stainless) steel?

9. What is used to form a hard surface on steel?
10. What are high-speed steels alloyed with?

3. Find the following words and word combinations in the text

1. сплав железа и углерода
2. прочный и жесткий
3. легко коррозирует
4. нержавеющая сталь
5. низкое содержание углерода
6. ковкость
7. листовое железо, проволока, трубы
8. конструкционные стали
9. пригодны дляковки и сварки
10. твердый и хрупкий
11. режущие инструменты
12. хирургические инструменты
13. инструментальная сталь
14. упрочнять
15. добавление марганца (кремния, хрома, вольфрама, молибдена, ванадия)

Text 6. Metalworking processes

1. Read and translate the text

Metals are important in industry because they can be easily deformed into useful shapes. A lot of metalworking processes have been developed for certain applications. They can be divided into five broad groups: rolling, extrusion, drawing, forging, sheet-metal forming.

Sheet metal forming is widely used when parts of certain shape and size are needed. It includes forging, bending and shearing. One characteristic of sheet metal forming is that the thickness of the sheet changes little in processing. The metal is stretched just beyond its yield point in order to retain the new shape. Bending can be done by pressing two dies. Shearing is a cutting operation similar to that used for cloth. Each of these processes may be used alone, but often all three are used on one part.

Forging is the shaping of a piece of metal by pushing with open or closed dies. It is usually done hot in order to reduce the required force and increase the metal's plasticity.

Open-die forging is usually done by hammering a part between two flat faces. It is used to make parts that are too big to be formed in a closed die or in cases where only a few parts are to be made.

Closed-die forging is the shaping of hot metal within the walls of two dies that come together to enclose the workpiece on all sides.

The process starts with a rod or bar cut to the length needed to fill the die. Since large, complex shapes and large strains are involved, several dies may be used to go from the initial bar to the final shape. With closed dies, parts can be made to close tolerances so that little finish machining is required.

2. Answer the following questions

1. Why are metals so important in industry?
2. What are the main metalworking processes?
3. What does sheet metal forming include?
4. What is forging?
5. Why is forging usually done hot?

Text 6. Drawing

1. Read and translate the text

Drawing

Drawing consists of **pulling** metal through a die. One type is wire drawing. The diameter **reduction** that can be **achieved** in one die is limited, but several dies **in series** can be used to get the desired reduction.

Sheet metal forming

Sheet metal forming (штамповка листового металла) is widely used when parts of certain shape and size are needed. It includes forging, bending and shearing. One characteristic of sheet metal forming is that the thickness of the sheet changes little in processing. The metal is stretched just **beyond** its **yield point** (2 to 4 percent strain) in order to **retain** the new shape. **Bending** can be done by pressing between two dies. **Shearing** is a cutting operation similar to that used for cloth.

Each of these processes may be used alone, but often all three are used on one part. For example, to make the roof of an automobile from a flat sheet, the **edges** are **gripped** and the piece pulled in tension over a **lower die**. Next an **upper die** is pressed over the top, finishing the **forming operation** (штамповку), and finally the edges are sheared off to give the final **dimensions**.

2. Forging

Forging is the shaping of a piece of metal by pushing with open or closed dies. It is usually done hot in order to reduce the **required** force and **increase** the metal's plasticity.

Open-die forging is usually done by **hammering** a part between two flat faces. It is used to make parts that are too big to be formed in a closed die or in cases where only a few parts are to be made. The earliest forging machines lifted a large hammer that was then dropped on the workpiece, but now air or steam hammers are used, since they allow greater control over the force and the rate of forming. The part is shaped by moving or turning it between blows.

Closed-die forging is the shaping of hot metal **within** the walls of two dies that come together to **enclose** the workpiece on all sides. The process starts with a **rod or bar** cut to the length needed to fill the die. Since large, complex shapes and large strains are **involved**, several dies may be used to go from the initial bar to the final shape. With closed dies, parts can be made to close **tolerances** so that little finish machining is required.

Two closed-die forging operations are given special names. They are **upsetting** and **coining**. Coining takes its name from the final stage of forming metal coins, where the desired **imprint** is formed on a metal disk that is pressed in a closed die. Coining involves small strains and is done cold. Upsetting involves a flow of the metal back upon itself. An example of this process is the pushing of a short length of a rod through a hole, **clamping** the rod, and then **hitting** the exposed length with a die to form the head of a **nail or bolt**.

2. Answer the questions

- 1) How can the reduction of diameter in wire drawing be achieved?
- 2) What is sheet metal forming and where it can be used?

- 3) What is close-die forging?
- 4) What is forging?
- 5) What are the types of forging?
- 6) What types of hammers are used now?
- 7) Where are coining and upsetting used?
- 8) What process is used in wire production?

3. Find the following word combinations in the text

- 1) волочение проволоки
- 2) уменьшение диаметра
- 3) толщина листа
- 4) конечные размеры
- 5) уменьшить необходимое усилие
- 6) увеличить пластичность металла
- 7) воздушные или паровые молоты
- 8) сила и скорость штампования
- 9) отделочная обработка
- 10) малые допуски

Text 7 From the History of Welding

1. Read and translate the text

Welding is a technique used for **joining** metallic parts usually through the application of heat. This technique was discovered during efforts to manipulate iron into useful shapes. Welded blades were developed in the first millennium AD, the most famous being those produced by Arab **armorers**

at Damascus, Syria. The process of **carburization** of iron to produce hard steel was known at this time, but the resultant steel was very **brittle**. The welding technique - which involved **interlayering** relatively soft and tough iron with **high-carbon** material, followed by **hammer forging** - produced a strong, tough blade. In modern times the improvement in iron-making techniques, especially the introduction of **cast iron**, restricted welding to the **blacksmith** and the **jeweler**. Other joining techniques, such as fastening by bolts or rivets, were widely applied to new products, from bridges and railway engines to kitchen utensils. Modern **fusion** welding processes are an outgrowth of the need to obtain a continuous **joint** on large steel plates. **Riveting** had been shown to have disadvantages, especially for an enclosed container such as a **boiler**.

Gas welding, arc welding, and **resistance** welding all appeared at the end of the 19th century. The first real attempt to adopt welding processes on a wide scale was made during World War I. By 1916 the **oxyacetylene** process was well developed, and the welding techniques employed then are still used. The main improvements since then have been in equipment and safety. Arcwelding, using a **consumable** electrode, was also introduced in this period, but the bare wires initially used produced brittle welds. A solution was found by wrapping the **bare** wire with **asbestos** and an entwined aluminum wire. The modern electrode, introduced in 1907, consists of a bare wire with a complex **coating** of minerals and metals. Arc welding was not universally used until World War II, when the urgent need for rapid means of construction for shipping, power plants, transportation, and structures spurred the necessary development work.

Resistance welding, invented in 1877 by Elihu Thomson, was accepted long before arc welding for **spot** and **seam** joining of **sheet**. **Butt** welding for chain making and joining **bars** and **rods** was developed during the 1920s. In the 1940s the tungsten-inert gas process, using a nonconsumable **tungsten** electrode to perform fusion welds, was introduced. In 1948 a new gas shielded process utilized a wire electrode that was consumed in the weld. More recently, electron-

beam welding, laser welding, and several solid phase processes such as diffusion **bonding**, friction welding, and ultrasonic joining have been developed.

2. Answer the questions

1. How was welding discovered?
2. What types of welding appeared at the end of the 19th century?
3. When was the arc welding using a consumable electrode introduced?
4. Who is the inventor of resistance welding?
5. When was tungsten-inert gas welding introduced?

Text 8 Welding.

1. Read and translate the text

Welding is a process when metal parts are joined together by the application of heat, pressure, or a combination of both. The processes of welding can be divided into two main groups:

- pressure welding, when the weld is achieved by pressure and
- heat welding, when the weld is achieved by heat. Heat welding is the most common welding process used today.

Nowadays welding is used instead of bolting and riveting in the construction of many types of structures, including bridges, buildings, and ships. It is also a basic process in the manufacture of machinery and in the motor and aircraft industries. It is necessary almost in all productions where metals are used.

The welding process depends greatly on the properties of the metals, the purpose of their application and the available equipment. Welding processes are classified according to the sources of heat and pressure used: gas welding, arc welding, and resistance welding. Other joining processes are laser welding, and electron-beam welding.

2. Answer the questions

1. How can the process of welding be defined?
2. What are the two main groups of welding process?
3. How can we join metal parts together?
4. What does the welding process depend on?

3. Find in the text

1. Сегодня сварка используется вместо соединения болтами.
2. Сварочный процесс в основном зависит от свойств металла.
3. Сварка необходима почти во всех производствах, где используется металл.
4. Сварка нагреванием- самый распространенный процесс сварки сегодня.

Text 9. TIG welding

1. Translate the following words and expressions into Russian

Tungsten inert gas welding	
an extremely high melting point	
high pressure cylinder	
melt	
non consumable electrode	

Direct current (DC)	
Alternating current (AC)	
collet	
shielding gas	
melting the base material	
electric arc	
control the amount of heat	
filler rod	
tighten up	
loosen	

2. Watch this video <https://www.youtube.com/watch?v=uO5pVLOAmD4&t=151s>

Are these statements true or false

- a) The tungsten electrode melts and becomes a filler metal.
- b) In TIG welding the molten metal is protected by a shielding gas.
- c) Inert gas is stored in high pressure cylinders.
- d) You can't TIG weld without a filler metal.
- e) The heat is generated by an arc between the base metal and the tungsten electrode.
- f) In aluminium welding is AC used.

3. Read the text and translate into Russian

In TIG welding, a tungsten electrode heats the metal you are welding and gas (most commonly Argon) protects the weld puddle from airborne contaminants. TIG welding produces clean, precise welds on any metal.

- ✓ TIG welding uses a non-consumable tungsten
- ✓ Filler metal, when required, is added by hand
- ✓ Shielding gas protects the weld and tungsten
- ✓ Produces high quality, clean welds
- ✓ Welds more metals than any other process

TIG welding can be used to weld steel, stainless steel, aluminum, nickel alloys, magnesium, copper, brass, bronze, and even gold.

With superior arc and weld puddle control, TIG allows you to create clean welds when appearances count. Because the heat input is often controlled by pressing on a foot pedal, similar to driving a car, TIG welding allows you to heat up or cool down the weld puddle giving you precise weld bead control. This makes TIG welding ideal for cosmetic welds like sculptures and automotive welds.

Because only the necessary amount of filler metal is added to the welding puddle, no spatter or sparks are produced (if the metal being welded is clean).

TIG welding does not create smoke or fumes, unless the base metal being welded contains contaminants or elements such as, oil, grease, paint, lead or zinc. The base metal should be cleaned before welding.

Because Argon can be used to TIG weld all metals and thicknesses you only need one type of gas in your shop to handle all of your welding projects.

TIG welds can be made in all positions - flat, horizontal, vertical or overhead. Perfect for roll cages and inside confined areas.

Text 8. Machine-tools

1. Read and translate texts.

Machine-tools

Machine-tools are used to shape metals and other materials. The material to be shaped is called the workpiece. Most machine-tools are now electrically driven. Machine-tools with electrical drive are faster and more accurate than hand tools: they were an important element in the development of mass-production processes, as they allowed individual parts to be made in large numbers so as to be interchangeable.

All machine-tools have facilities for holding both the workpiece and the tool, and for accurately controlling the movement of the cutting tool relative to the workpiece. Most machining operations generate large amounts of heat, and use cooling fluids (usually a mixture of water and oils) for cooling and lubrication.

Machine-tools usually work materials mechanically but other machining methods have been developed lately. They include chemical machining, spark erosion to machine very hard materials to any shape by means of a continuous high-voltage spark (discharge) between an electrode and a workpiece. Other machining methods include drilling using ultrasound, and cutting by means of a laser beam. Numerical control of machine-tools and flexible manufacturing systems have made it possible for complete systems of machine-tools to be used flexibly for the manufacture of a range of products.

2. Answer the questions.

1. What are machine-tools used for?
2. How are most machine-tools driven nowadays?
3. What facilities have all machine-tools?
4. How are the cutting tool and the workpiece cooled during machining?
5. What other machining methods have been developed lately?
6. What systems are used now for the manufacture of a range of products without the use of manual labor?

3. Find English equivalents in the text.

1. обрабатываемый материал
2. электропривод
3. более точный
4. отдельные детали
5. процесс массового производства
6. приспособления для держания резца и детали
7. операции по механической обработке детали

8. высоковольтный разряд
9. сверление ультразвуком
10. резание с помощью лазерного луча
11. гибкие производственные системы

Text 9. Automation

1. Read and translate the text.

Automation is the system of manufacture performing certain tasks, previously done by people, by machines only. The sequences of operations are controlled automatically. The most familiar example of a highly automated system is an assembly plant for automobiles or other complex products.

The term automation is also used to describe non-manufacturing systems in which automatic devices can operate independently of human control. Such devices as automatic pilots, automatic telephone equipment and automated control systems are used to perform various operations much faster and better than could be done by people.

Automated manufacturing had several steps in its development. Mechanization was the first step necessary in the development of automation. The simplification of work made it possible to design and build machines that resembled the motions of the worker. These specialized machines were motorized and they had better production efficiency.

Industrial robots, originally designed only to perform simple tasks in environments dangerous to human workers, are now widely used to transfer, manipulate, and position both light and heavy workpieces performing all the functions of a transfer machine.

In the 1920s the automobile industry for the first time used an integrated system of production. This method of production was adopted by most car manufacturers and became known as Detroit automation.

The feedback principle is used in all automatic-control mechanisms when machines have ability to correct themselves. The feedback principle has been used for centuries. An outstanding early example is the flyball governor, invented in 1788 by James Watt to control the speed of the steam engine. The common household thermostat is another example of a feedback device.

Using feedback devices, machines can start, stop, speed up, slow down, count, inspect, test, compare, and measure. These operations are commonly applied to a wide variety of production operations.

Computers have greatly facilitated the use of feedback in manufacturing processes. Computers gave rise to the development of numerically controlled machines. The motions of these machines are controlled by punched paper or magnetic tapes. In numerically controlled machining centres machine tools can perform several different machining operations.

More recently, the introduction of microprocessors and computers have made possible the development of computer-aided design and computer-aided manufacture (CAD and CAM) technologies. When using these systems a designer draws a part and indicates its dimensions with the help of a mouse, light pen, or other input device. After the drawing has been completed the computer automatically gives the instructions that direct a machining centre to machine the part.

Another development using automation are the flexible manufacturing systems (FMS). A computer in FMS can be used to monitor and control the operation of the whole factory.

Automation has also had an influence on the areas of the economy other than manufacturing. Small computers are used in systems called word processors, which are rapidly becoming a standard part of the modern office. They are used to edit texts, to type letters and so on.

Automation in industry

Many industries are highly automated or use automation technology in some part of their operation. In communications and especially in the telephone industry dialing and transmission are all done automatically. Railways are also controlled by automatic signaling devices, which have sensors that detect carriages passing a particular point. In this way the movement and location

of trains can be monitored.

Not all industries require the same degree of automation. Sales, agriculture, and some service industries are difficult to automate, though agriculture industry may become more mechanized, especially in the processing and packaging of foods.

The automation technology in manufacturing and assembly is widely used in car and other consumer product industries.

Nevertheless, each industry has its own concept of automation that answers its particular production needs.

2. Answer the questions.

1. What is automation according to the text?
2. What was the first step in the development of automaton?
3. What were the first robots originally designed for?
4. What was the first industry to adopt the new integrated system of production?
5. What is feedback principle?
6. What do the abbreviations CAM and CAD stand for?
7. What is FMS?
8. What industries use automation technologies?

Task 3. Find the following words and word combinations in the text.

1. автоматические устройства
2. автоматизированное производство
3. выполнять простые задачи
4. как легкие, так и тяжелые детали
5. интегрированная система производства
6. принцип обратной связи
7. механизм может разгоняться и тормозить
8. компьютер автоматически посылает команды
9. высокоавтоматизированная система
10. непроизводственная система

Text 10. Applications of Automation and Robotics in Industry

1. Read and translate the text.

Manufacturing is one of the most important application area for automation technology. There are several types of automation in manufacturing. The examples of automated systems used in manufacturing are described below.

1. Fixed automation, sometimes called «hard automation» refers to automated machines in which the **equipment** configuration allows fixed **sequence** of processing operations. These machines are programmed by their design to make only certain processing operations. They are not easily changed over from one product style to another. This form of automation needs high initial investments and high production rates. That is why it is suitable for products that are made in large volumes. Examples of fixed automation are machining transfer lines found in the automobile industry, automatic **assembly machines** and certain chemical processes.

2. Programmable automation is a form of automation for producing products in large **quantities**, ranging from several dozen to several thousand units at a time. For each new product the production equipment must be reprogrammed and changed over. This reprogramming and changeover take a period of **non-productive** time. Production rates in programmable automation are generally lower than in fixed automation, because the equipment is designed to **facilitate** product **changeover** rather than for product specialization. A numerical-control machine-tool is a good example of programmable automation. The program is coded in computer memory for each different product style and the machine-tool is controlled by the computer programme.

3. Flexible automation is a kind of programmable automation. Programmable automation requires time to re-program and change over the production equipment for each series of new product. This

is lost production time, which is expensive. In flexible automation the number of products is limited so that the changeover of the equipment can be done very quickly and automatically. The reprogramming of the equipment in flexible automation is done at a computer terminal without using the production equipment itself. Flexible automation allows a mixture of different products to be produced one right after another.

2. Answer the questions.

1. What is the most important application of automation?
2. What are the types of automation used in manufacturing?
3. What is fixed automation?
4. What are the limitations of hard automation?
5. What is the best example of programmable automation?
6. What are the limitations of programmable automation?
7. What are the advantages of flexible automation?
8. Is it possible to produce different products one after another using automation technology?

3. Find equivalents in English in the text.

1. сфера применения
2. фиксированная последовательность операций
3. автоматические сборочные машины
4. определенные химические процессы
5. станок с числовым программным управлением
6. потерянное производственное время
7. разнообразная продукция

Text 11. Types of technical documentation

A modern enterprise is a complex organism. The efficiency of its operation depends on how well the technological processes are performed in it. To ensure that the enterprise management system does not fail, it is necessary to conduct high-quality training before starting the production process. The process documentation is used for this purpose. It provides complete information on all aspects of production, which makes it possible to coordinate technological processes and effectively manage them.

Technical documentation (TD) is a set of documents required to comply with the conditions of design, manufacture and operation of products. The development of technical documentation is carried out in accordance with the standards of the Unified system of design (ESKD), technological (ESTD) and software (ESPD) documentation.

Types of documentation:

Technical conditions:

This document sets out technical requirements for a specific product, material, substance, or group of them. The technical conditions specifies the procedure for verifying that these requirements are met correctly. Technical specifications are drawn up at the request of the customer or the decision of the manufacturer of the product. The development of technical specifications is regulated by GOST 2.114-95, Federal law No. 184 of 27.12.2002 and GOST R 51740-2001.

A passport for the products:

The documentation contains information about the main parameters and characteristics of the product, manufacturer's guarantees, and requirements for certification and disposal. The passport also specifies the complete set, information about operation, storage, and other

information about the product. The document is developed in accordance with GOST 2.601-2006 at the request of the product manufacturer.

Operating instructions:

This document contains information about the principles of operation, design and properties of the product, necessary to comply with the conditions of safe operation. The operating instructions consists of the following sections: intended use, description and operation, current repairs and maintenance, transportation, storage and disposal conditions. Documentation is compiled in accordance with GOST 2.601-2006.

Task 1. Find the definition.

1	Technical conditions	a. contains information about the main parameters and characteristics of the product, manufacturer's guarantees, and requirements for certification and disposal
2	A passport for the products	b. sets out technical requirements for a specific product, material, substance, or group of them.
3	Operating instructions	c. is a set of documents required to comply with the conditions of design, manufacture and operation of products.

All technological documentation is divided into two groups: General purpose and special purpose

General purpose documents

There are three types of documents in this group. They are basic and define the structure of the system, so you need to pay attention to their implementation.

- title (title) sheet;
- * thumbnail map;
- * process instructions.

The section of technological documentation always begins with the title page. Separate cover pages are also issued for all operations.

The task of the sketch map is to illustrate the process as a whole or a segment of it. This is a graphic material that includes schematic images, diagrams, drawings, and tables that explain the flow of a process, operation, or transition. Sketch maps are also used for setting up, testing, and transporting the product.

If the sketch map shows the material clearly, then the process instructions are the same data, only in the form of text. In addition, it sets out the rules for using equipment and equipment, safety instructions, and describes repetitive technological techniques and techniques. The process manual helps reduce the number of documents produced.

Task 2. Find the equivalents.

1. setting up	a. карта эскизов
2. thumbnail map	b. правила пользования оборудованием и оснащением
3. the rules for using equipment and equipment	c. наладка
4. safety instructions	d. технологическая инструкция
5. process instructions	e. описываются повторяющиеся технологические методики и приемы
6. describes repetitive technological techniques and techniques	f. распоряжения по технике безопасности

Special purpose documents

This category includes many types of documentation. We'll look at a few key ones.

- route map;
- operating card;
- pick the map;
- the sheet of technological routes;
- snap-in sheet;
- bill of materials;
- list of technological documents

Let's start with the route map, because it is the main and mandatory document for any production. In fact, a route map is an algorithm for executing processes with a brief description of them. The route map contains information about equipment, tools, labor and financial indicators. For some types of work (for example, electrical, mechanical, and locksmith work), individual route maps are provided. Sometimes, instead of a route map, you can use a map of the corresponding technological process.

An operating map is required only in situations where non-recurring technical processes are planned. It contains a description of the operation and transition chain, information about tools, modes, labor costs, and project standards.

The completion card is required at the installation stages. It is a list of parts, semi-finished products, spare parts, mounting units and materials used to produce the finished product.

The list of technological routes plays an important role in the organization of production. It describes the route of moving the product through the plant's workshops or divisions during manufacturing, processing, or restoration.

For instructions and instructions on the tools and equipment used, see the tooling sheet.

To calculate the norms for the use of raw materials, spare parts, and blanks, a list of materials is compiled. It provides detailed information about the movement of the manufactured product, taking into account the expenditure of funds.

A list of technological documents is compiled for communication between enterprises when a set of documents is transferred from one organization to another. This is an inventory of all materials that accompany the manufacture or repair of the product.

Technical verification of documents

The extensive set of technological documentation also includes materials for checking documents (for example, the statement of technological control).

During verification, both formal errors (inaccuracies in the execution of drawings or instructions, design flaws or incomplete equipment) and design flaws are detected.

Technological control of documents at the pre-production stage allows you to avoid many problems. It is often possible to optimize the design project, simplify some details, type unique technological processes, reduce too high requirements for processing accuracy, and so on.

Specialists in the design Department study the proposals received during the verification process and make necessary changes to the documentation, if appropriate. Document control allows you to reduce the cost of production and improve its quality, avoid defects, and reduce production losses.

There are many types of technological documents. The rules for their registration are prescribed by international standards and must be observed. In order to avoid problems during the production process, it is better to contact Tehpis specialists at the preparation stage, who will correctly perform all the necessary documentation.

Task 3. Complete the sentences.

1. There are many types	a. are prescribed by international standards and must be observed.
2. Technological control of documents at the pre-production stage	b. allows you to avoid many problems
3. A list of technological documents	c. of technological documents
4. The rules for their registration	d. and design flaws are detected
5. During verification, both formal errors (inaccuracies in the execution of drawings or instructions, design flaws or incomplete equipment)	e. is compiled for communication between enterprises when a set of documents is transferred from one organization to another.

2.2 Задания для промежуточной аттестации

Задания для промежуточной аттестации в форме зачета представлены в форме работы по видео с профессионально направленным содержанием.

10 differences between stainless steel and aluminum

Watch this video https://www.youtube.com/watch?v=j5AI0BuWg2s&feature=emb_logo and do all the tasks

1. Are these sentences true or false?

- 1) Stainless steel is less reactive with foods.
- 2) Stainless steel is typically very cheap.
- 3) Aluminium is as strong as stainless steel.
- 4) Stainless steel is a very good electrical conductor.
- 5) Stainless steel can be used at very high temperatures.
- 6) Aluminum is very easy to weld.
- 7) Stainless steel is difficult to work due to its wear resistance.
- 8) Aluminium is excellent corrosion resistant where stainless steel is poor.

2. Answer the following questions

- 1) Why is aluminium used for car radiators?
- 2) Why are aircraft made of aluminum?
- 3) Why is aluminum so popular in car industry?
- 4) Why is stainless steel corrosion resistant?
- 5) Why can't we use aluminum at very high temperatures?

3. Fill in the gaps. Use the following words and expressions. Complete the sentences.

- a) Stainless steel
- b) metal
- c) a thin layer of oxide
- d) martensitic
- e) braze
- f) aluminium
- g) low-carbon steel
- h) carbon
- i) SS
- j) deformation under compression
- k) an alloy
- l) wear resistance

1. Stainless steel is known as _____ in the engineering parlance.

2. Aluminium is the second most widely used _____ in the world.
3. Stainless steel is _____ of iron carbon and chromium.
4. Aluminium has _____, which protects it from damages.
5. High-carbon steels have excellent _____.
6. There are five types of stainless steel such as ferritic, _____, precipitation hardening, austenitic and duplex.
7. High-carbon steels are strong and resistant to _____.
8. _____ was invented in 1912 by Harry Brearley in Sheffield, England.
9. Aluminium is impossible to _____.
10. Radiators are made from _____ because its thermal conductivity is great.
11. _____ and mild steel are not brittle, but not ductile either.
12. If the main chemical element is _____, the steel is called carbon steel.

4. Speak about differences between stainless steel and aluminium

3. Рекомендуемая литература и иные источники

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