Střední průmyslová škola strojnická Olomouc, tř.17. listopadu 49

Výukový materiál zpracovaný v rámci projektu „Výuka moderně“
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Název: Materials used in engineering

Jméno autora: Mgr. Jana Novotná

Předmět: anglický jazyk

Jazyk: anglický, český

Klíčová slova: engineering, metallic materials, non-metallic materials, elements, alloys, heat treatment

Cílová skupina: žák 2. ročníku

Stupeň a typ vzdělání: střední odborné

Očekávaný výstup: žák si procvičí základní pojmy k tématu „materiály užívané ve strojírenství“.

Střední průmyslová škola strojnická Olomouc, tř.17. listopadu 49
tř. 17.listopadu 49, 772 11 Olomouc

Metodický list/anotace:

Žáci si na základě této prezentace osvojí jednoduchou slovní zásobu týkající se tématu „materiály ve strojírenství“. Při vyhotovování úkolů využijí své znalosti z chemie a jiných odborných předmětů.

Datum vytvoření: 14. 2. 2013

1. Match the English elements with the Czech equivalents.

1. TIN	A, KŘEMÍK
2. COPPER	B, ZINEK
3. TITANIUM	C, HLINÍK
4. ZINC	D, ŽELEZO
5. ALUMINIUM	E, CÍN
6. CARBON	F, TITAN
7. IRON	G, MEĎ
8. SILICON	H, UHLÍK

Key:

1. TIN - E, CÍN
2. COPPER - G, MĚĎ
3. TITANIUM - F, TITAN
4. ZINC - B, ZINEK
5. ALUMINIUM - C, HLINÍK
6. CARBON - H, UHLÍK
7. IRON - D, ŽELEZO
8. SILICON - A, KŘEMÍK

2. Which things are made of these materials?

1. Rubber - *a tyre,* _____
2. Silver - _____
3. Plastic - _____
4. Steel - _____
5. Glass - _____
6. Copper - _____
7. Wood - _____
8. Gold - _____
9. Aluminium - _____

Key (possible answers):

1. Rubber - *a tyre,* Wellington boots, etc.
2. Silver – a ring, earrings, etc.
3. Plastic – a bottle, keyboard, etc.
4. Steel – knives, bridges, etc.
5. Glass – glasses, windows, etc.
6. Copper – a rod, an electrical cable, etc.
7. Wood – furniture, toys, etc.
8. Gold – jewellery, teeth, etc.
9. Aluminium – a can, a door handle, etc.

3. Read the text.

Materials used in engineering

The materials used in engineering are divided into two groups: metallic and non-metallic.

NON-METALLIC MATERIALS are plastics, ceramics, corundum, etc.

METALLIC MATERIALS are steel and cast iron, aluminium and its alloys, copper, tin, zinc, lead, wolfram, titanium and others.

The best known materials used in engineering are steel and cast iron.

CAST IRON

It is an alloy of iron and other elements (carbon or silicon). It has many good properties: good fluidity, castability, excellent machinability, resistance to deformation and wear resistance.

STEEL

It can be classified according to its degree of hardness to *hypoeutectoid* that contains less than 0,8% carbon and *hypereutectoid* which contains more than 0,8 carbon.

Low-carbon steel can be machined and welded nicely, but hardened badly. Higher-carbon steels can be hardened nicely, but welded poorly.

The physical properties of steel include high strength, low weight, durability, flexibility, electrical conduction and corrosive and oxidation resistance.

Properties of metal materials can be influenced by HEAT TREATMENT. It is a process of controlled heating and cooling of metals to change their physical or mechanical properties.

Vocabulary

alloy – slitina
castability - slévatelnost
cast iron – litina
(to) classify – třídit
conduction – vodivost
contain – obsahovat
cooling – chlazení
corrosive resistance – odolnost proti korozi
degree – stupeň
durability – odolnost
flexibility – pružnost
fluidity – slévatelnost, tekutost
(to) harden – kalit
hardness – tvrdost
heat treatment – tepelné zpracování
heating – ohřívání
(to) include – zahrnovat
(to) influence – ovlivnit
lead - olovo
(to) machine – obrábět
machinability - obrobitelnost
properties – vlastnosti
resistance - odolnost
steel – ocel
strength – síla, pevnost
wear resistance – odolnost proti opotřebení
weight – váha, hmotnost
(to) weld – svářet

4. Are the sentences true or false?

1. Tin, copper and zinc are non-metallic materials. _____
2. Cast iron can be machined easily. _____
3. Steel is an electrical conductor. _____
4. Low-carbon steel can be welded nicely. _____
5. Heat treatment is a process of controlled cooling. _____
6. Steel is not corrosive resistant. _____
7. Steel is an alloy. _____
8. Cast iron is not very resistant to deformation. _____

Key:

1. Tin, copper and zinc are non-metallic materials. **false**
2. Cast iron can be machined easily. **true**
3. Steel is an electrical conductor. **true**
4. Low-carbon steel can be welded nicely. **true**
5. Heat treatment is a process of controlled cooling. **false**
6. Steel is not corrosive resistant. **false**
7. Steel is an alloy. **true**
8. Cast iron is not very resistant to deformation. **false**

5. Read the text about other materials. Match the words with the texts.

a – COPPER **b – ALUMINIUM** **c - TITANIUM**

1. _____ is sometimes called „space age metal“. It has low density and it is lustrous and corrosion resistant (also to sea water). Its alloys are used in aerospace and automobile industry.

2. _____ is known for its light weight and low density. Structural components made from this material and its alloys are important in aerospace industry.

3. _____ is malleable and ductile metal and it is a very good conductor. It is used for making electrical cables. Its alloys are called brass (with zinc) and bronze (with tin).

Vocabulary

brass – mosaz
bronze - bronz
cable - kabel
component – součástka
conductor - vodič
density – hustota
ductile – kujný, tažný
low – nízký
lustrous – lesklý
malleable – kujný, tvárný
metal - kov

Key:

1. TITANIUM (c) is sometimes called „space age metal“. It has low density and it is lustrous and corrosion resistant (also to sea water). Its alloys are used in aerospace and automobile industry.

2. ALUMINIUM (b) is known for its light weight and low density. Structural components made from this material and its alloys are important in aerospace industry.

3. COPPER (a) is malleable and ductile metal and it is a very good conductor. It is used for making electrical cables. Its alloys are called brass (with zinc) and bronze (with tin).

Použitá literatura:

vlastní zdroje

DEUTSCH, P., HENDRYCHOVÁ, P. *Technická angličtina zaměřená pro střední průmyslové školy se zaměřením na elektrotechniku a strojírenství*. Olomouc, 2011.