AJLLSE GLOBAL RESEARCH NETWORK

AMERICAN Journal of Language, Literacy and Learning in STEM Education
Volume 3, Issue 6, 2025 ISSN (E): 2993-2769

Use of Fibers in the Processing of Metal and Non-Metallic Products

Jaloldinova Shakhnoza Khasanboyevna
Andijan State Pedagogical Institute, Acting Associate Professor

Qurbonova Feruzaxon Adaxamjon qizi
Andijan State Pedagogical Institute, Technological Education 1st Stage, student

Abstract: *In this article, metals have different properties, some of which are soft. and elastic, and some are hard, flexible, or brittle. Metallic Properties of metals for selecting suitable materials for manufacturing products. Introduction: Metals (Latin: metallum; Ancient Greek: metallon - I dig, or I dig from the ground) - high electrical conductivity under normal conditions, hot conductivity, electrical conductivity, good conductance of electromagnetic waves Simple substances with specific properties such as reflectivity and plasticity. Metals in the solid state have a crystalline structure. In the vapor state, it is monatomic.*

Key words: *Steel and cast iron, ore, hardness of metal, plasticity of metal, Elasticity of metal.*

Metalworking - a set of processes performed during the thermal, mechanical, and chemical treatment of metals and alloys. Thermal treatment of metals - operations used to change the properties (internal structure) of metals and alloys: annealing, hardening, normalizing, tempering, improving, quenching, thermochemical treatment, passivation. Annealing - heating metals to a certain temperature, holding them at this temperature for a specific time, then cooling them gradually, sometimes together with the furnace; this process changes the properties of the metals. As a result, the malleability and plasticity of metals increase, and their magnetization and other properties improve. Hardening involves rapidly cooling metals after heating them to a certain temperature; in this process, the heterogeneous structural states of the metals are stabilized, and the properties of the metals change in various ways. Normalizing - heating low (up to 0.3%) and medium (0.3-0.6%) carbon steel to approximately 800-950°C and cooling it in air; this reduces the size of coarse grains in the steel, increasing its strength, plasticity, and toughness. Improving - a type of heat treatment consisting of hardening and tempering at a temperature of 550-650°C. Used for machine parts operating under dynamic load. Quenching - changing the structure and properties of metals and alloys by prolonged storage at room temperature (natural aging) or heating (artificial aging). This improves hardness, strength, magnetic and other properties. Thermochemical processing of metals - heating metals at a high temperature in a chemically active gas, solid, or liquid medium and cooling them slightly at this temperature. This process changes the chemical composition, structure, and properties of the surface layers of metal products. It includes nitriding, chromium plating, metallizing, and others. In this case, the chemical composition, structure, and properties of the surface layers of metal products change.

Mechanical processing of metals - giving parts various shapes and sizes by removing material as chips. It is performed using metal-cutting tools (cutters, drills, countersinks, reamers, milling cutters, etc.) and metal-cutting machines (lathes, grinding machines, planing machines, etc.). Pressure treatment of metals - the shaping of metal blanks and products without removing material. Based on utilizing the plasticity of metals. Main types: rolling - passing metal through rotating

cylinders (rollers) (figure a); drawing - pulling a metal workpiece through a hole smaller than its size (figure b); extrusion - forcing metal through a hole in a closed cylinder (figure c); forging - shaping metals to the required form and size by repeated hammer or press strikes (figure d); sheet stamping - deforming sheet, strip, or band metal without significantly affecting its thickness (figure e); in this case, the metal takes the shape corresponding to the working part of the punch and die. Bulk forming - deformation of the metal (workpiece) by changing all its dimensions (figure f); in this case, the metal takes the form of a special tool (die) cavity. Solutions form a thin oxide film on the metal surface, protecting it from corrosion. The oxide film protects the metal from environmental influences and enhances its appearance. Metal does not react with any substance. Iron, nickel, cobalt, chromium, manganese, aluminum, and other metals are "passivated," i.e., treated with special substances - oxidizing agents (e.g., chromates).

Glass, ceramics and related materials.

This chapter covers the following product categories:

- glass
- synthetic glass fibers
- pottery
- ceramic tiles
- industrial ceramics
- bricks and tiles
- refractories
- synthetic stones
- optical fibers

Interestingly, most of these industries not only have ancient origins but also share a number of common processes. For example, all of them are based on the use of natural raw materials in the form of powder or fine particles, which are transformed into the desired products through heat treatment. Therefore, despite the variety of processes and products included in this group, these common processes allow for a general overview of potential health risks associated with these fields. Since different manufacturing industries range from small, fragmented segments (such as brick production) to large, technically complex manufacturing enterprises employing thousands of workers, each sector is characterized separately.

General processes and risks:

In the production of products in these business sectors, there are common safety and health risks. Risks and control measures are discussed in other sections of the Encyclopedia. The risks specific to each process are discussed in separate sections of this chapter.

In this business area, the processes of material processing, production, and packaging differ significantly, such as the size, shape, and weight of the products. The high density of materials in this sector or large-volume configurations create common hazards when working with materials. Manual lifting and handling of materials during production, manufacturing, packaging, and storage in this field cause many disability injuries. (See the section "Profile of injury and disease" below.) Injury reduction efforts are aimed at reducing hand lifting and handling of materials. For example, innovative packaging designs, robotics for packing and palleting finished products, and automatically controlled storage vehicles have begun to be used in certain parts of this business sector for manual processing and related injuries. The use of conveyors, controlled hoists (such as vacuum hoists), and scissor platforms for processing and palleting products is currently a common practice in material processing.

Steel and cast iron are alloys of iron and carbon. But steel's containing less carbon than the carbon content of cast iron, i.e., 2% until. The carbon content in cast iron is 2-4%. Cast iron containing

silicon, hard alloy. The process of obtaining metals from ores in pure form in engineering, reduction, thermal decomposition, as a result of exchange processes, various branches of metallurgy, namely Pyrometallurgy, hydromerallurgy and electrometallurgy is possible. Method of vacuum distillation of substances for obtaining ultra-pure metals can also be used. In recent years, zones-wise melting has become widespread. Is being applied. Based on this method, heated with an electron beam lamp, mainly niobium, tantalum, tungsten, and other metals are purified from foreign substances. Metals in their pure form rarely used. Often used as an alloy. Mac, cast iron, steel, brass, bronze, constantan, melchior, nichrome, etc. under atmospheric conditions metals undergo corrosion. Protection of metal products from corrosion is of vital importance. Method of manufacturing special stainless steels will help solve this problem. Metals in everyday life, construction, in cosmonautics, shipbuilding, mechanical engineering, aircraft construction, and much more. Are used in various fields.

Hardness, elasticity, plasticity, and brittleness in metalworking our understanding of the mechanical properties is of great importance. The hardness of a metal is its resistance to the action of other substances, i.e., harder objects. We denote by the ability. If the steel is attached to the frame placed on the plate When struck with a hammer, a small depression forms on the plate. However, when this is done with a plate, the recess will be larger. Steel from this We can understand that it is harder than copper.

Plasticity refers to the ability of a metal to change its shape under the influence of an external force. but is called sinmas, that is, plastic metal. This metal's widely used in smoothing, bending, spreading, and stamping. The elasticity of a metal refers to the ability of the metal to return to its original state after the action of a force. Simultaneously pulling steel and copper springs and try releasing it. In this case, the steel spring returns to its original state, the copper and you will see that the spring remains stretched.

Used literature:

1. Zaysev B. Ye., Obshiye fizicheskiye i ximicheskiye svoystva metallov, M ., 1987. Peksheva N. P., Ximiya metallov, Krasnoyarsk, 1987. BobilevA. V., Mexanicheskiye i texnologicheskiye svoystva metallov, 2 izd., M ., 1987.
2. Texnologiya umumiy o’rta ta’lim maktablarining 6-sinf uchun darslik/ SH. SHaripov, O.Qo’sinov, Q. Abdullayeva – “SHarq” 2017.