

Описание видов соединения компонентом механизма

Task 1

Прочтите и переведите текст. Обратите внимание на выделенные слова.

Welding is a fabrication or sculptural process that joins materials, usually metals or thermoplastics, by causing coalescence. This is often done by melting the workpieces and adding a filler material to form a pool of molten material (the weld pool) that cools to become a strong joint, with pressure sometimes used in conjunction with heat, or by itself, to produce the weld. This is in contrast with soldering and brazing, which involve melting a lower-melting-point material between the workpieces to form a bond between them, without melting the workpieces.

Many different energy sources can be used for welding, including a gas flame, an electric arc, a laser, an electron beam, friction, and ultrasound. While often an industrial process, welding may be performed in many different environments, including open air, under water and in outer space. Welding is a potentially hazardous undertaking and precautions are required to avoid burns, electric shock, vision damage, inhalation of poisonous gases and fumes, and exposure to intense ultraviolet radiation.

Bolted joints are one of the most common elements in construction and machine design. They consist of fasteners that capture and join other parts, and are secured with the mating of screw threads.

There are two main types of bolted joint designs. In one method the bolt is tightened to a calculated clamp load, usually by applying a measured torque load. The joint will be designed such that the clamp load is never overcome by the forces acting on the joint (and therefore the joined parts see no relative motion).

A **rivet** is a permanent mechanical fastener. Before being installed a rivet consists of a smooth cylindrical shaft with a head on one end. The end opposite the head is called the buck-tail. On installation the rivet is placed in a punched or drilled hole, and the tail is upset, or bucked (i.e., deformed), so that it expands to about 1.5 times the original shaft diameter, holding the rivet in place. To distinguish between the two ends of the rivet, the original head is called the factory head and the deformed end is called the shop head or buck-tail.

Because there is effectively a head on each end of an installed rivet, it can support tension loads (loads parallel to the axis of the shaft); however, it is much more capable of supporting shear loads (loads perpendicular to the axis of the shaft). Bolts and screws are better suited for tension applications.

Fastenings used in traditional wooden boat building, like copper nails and clinch bolts, work on the same principle as the rivet but were in use long before the

term rivet came about and, where they are remembered, are usually classified among the nails and bolts respectively.

Brazing is a metal-joining process whereby a filler metal is heated above melting point and distributed between two or more close-fitting parts by capillary action. The filler metal is brought slightly above its melting (liquidus) temperature while protected by a suitable atmosphere, usually a flux. It then flows over the base metal (known as wetting) and is then cooled to join the workpieces together. It is similar to soldering, except the temperatures used to melt the filler metal are higher.

An **adhesive** or stick on is a material, usually in a liquid or semi-liquid state, that adheres or bonds items together. Adhesives come from either natural or synthetic sources. The types of materials that can be bonded are vast but adhesives are especially useful for bonding thin materials. Adhesives cure (harden) by either evaporating a solvent or by chemical reactions that occur between two or more constituents.

Adhesives are advantageous for joining thin or dissimilar materials, minimizing weight, and providing a vibration-damping joint. A disadvantage of most adhesives is that most do not form an instantaneous joint, unlike many other joining processes, because the adhesive needs time to cure.

Task 2

Прочтите и переведите текст.

A **screw**, or bolt, is a type of fastener characterized by a helical ridge, known as an external thread or just thread, wrapped around a cylinder. Some screw threads are designed to mate with a complementary thread, known as an internal thread, often in the form of a nut or an object that has the internal thread formed into it. Other screw threads are designed to cut a helical groove in a softer material as the screw is inserted. The most common uses of screws are to hold objects together and to position objects.

Often screws have a head, which is a specially formed section on one end of the screw that allows it to be turned, or driven. Common tools for driving screws include screwdrivers and wrenches. The head is usually larger than the body of the screw, which keeps the screw from being driven deeper than the length of the screw and to provide a bearing surface. There are exceptions; for instance, carriage bolts have a domed head that is not designed to be driven; set screws have a head smaller than the outer diameter of the screw; J-bolts have a J-shaped head which is not designed to be driven, but rather is usually sunk into concrete allowing it to be used as an anchor bolt. The cylindrical portion of the screw from the underside of the head to the tip is known as the shank; it may be fully threaded or partially threaded. The distance between each thread is called the "pitch".

The majority of screws are tightened by clockwise rotation, which is termed a right-hand thread; a common mnemonic device for remembering this when working with screws or bolts is "righty-tighty, lefty-loosey." Screws with left-hand threads are used in exceptional cases. For example, when the screw will be subject to counterclockwise torque (which would work to undo a right-hand thread), a left-hand-threaded screw would be an appropriate choice. The left side pedal of a bicycle has a left-hand thread.

More generally, screw may mean any helical device, such as a clamp, a micrometer, a ship's propeller or an Archimedes' screw water pump.

Изучите следующие выражения, описывающие виды соединения компонентов друг к другу.

A is bolted to B. = A is connected to B with bolts.

A is welded to B. = A is connected to B by welding.

A is fixed to B. = no specific method given.

Task 3

Объясните каждый из методов соединения.

1	Screwed
2	Soldered
3	Attached
4	Wired
5	Bonded
6	Glued
7	Riveted
8	Welded
9	Brazed
10	Nailed

VOCABULARY

Welding	Сварка
Bolting	Соединенное болтами
Fixed	Просто присоединенное
Screwed	Прикрепленное болтами, винтами, шурупами.
Soldered	Соединенное (= паянное)
Brass	Латунь
Zink solder	Цинковая сварка
Attached	Подключенное, подсоединенное, примыкающее
Wired	Связанное, скрепленное проволокой
Glued	Склеенное
Riveted	Скрепленное заклепками (= клепать)
Welded	Приваренное сваркой
Brazed	Соединенное, паянное твердым припоем

Nailed	Прибитое гвоздями
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