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THE ROLE OF DEFORMATION IN CONSTRUCTION

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Abstract

The article discusses the elongation diagram, the most important deformation properties of building materials, the elongation diagram of brittle materials, and the properties of building structures. dangerous types of deformation are presented.

Keywords: elongation diagram, structure, macromolecule, strength, elastic deformation, plasticity, brittleness .

According to Hooke's law, stress is linearly related to strain. Experiments show that Hooke's law is only accurate for small values of elastic deformation. Figure 1 shows a graph of stress versus strain for some metals.

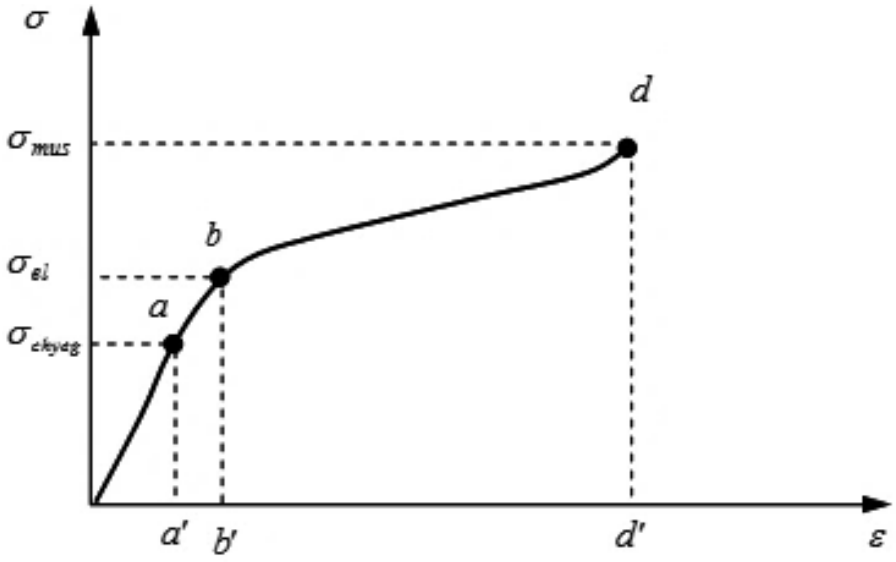

Figure 1. Expansion diagram.

The part of the bond from 0 to a is a straight line, indicating the full fulfillment of Hooke's law for cases where the values of the relative elongation are less than a´. For bodies consisting of macromolecules - polymers, this bond has a completely

different character. The reason for the name macromolecule is that each molecule in a polymer consists of a very large number of atoms. For example, one chain-like molecule of a polymer called polypropylene C_3H_7 is formed by the joining together of tens of thousands of polypropylene molecules. The relative change in elastic deformation of such polymers can be more than 600%.

The maximum value of the material stress at which the body can regain its previous shape and size even after the applied force is removed is called the elastic limit. When the elastic limit is reached, plastic deformation occurs in the body. In this case, there is a moment when, at the same stress, the deformation begins to increase and the material is destroyed. In construction and when adjusting machines, a reserve of strength is always created. The quantity that shows how many times the destruction load at the permissible stress in the structure is greater than the actual maximum load is called the reserve of strength.

The most important deformation properties of building materials are plasticity and brittleness. M a teria l power influence one 's own right if it changes and power when taken own previous to the shape very little in quantity if he returns, to this ***plasticity*** It is said. Such to materials lead, of steel some types, soaked clay and others Materials power significant in impact undeformed without broken departure its ***fragility*** it is said (s cast iron, concrete). The relative deformation of brittle materials does not exceed 2-5% (Figure 2).

Figure 2. Appearance of brittle material.

of brittle materials does not contain yield and strength regions (Figure 3).

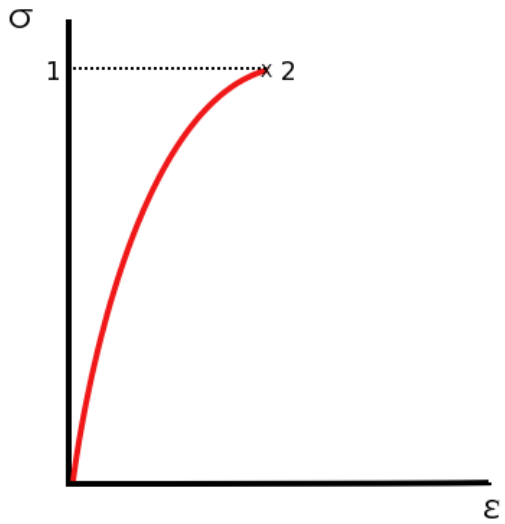

Figure 3. Elongation diagram of brittle materials .

The most dangerous deformation in construction structures is bending deformation. For example, steel cables in suspension bridges are used to suspend the road surface (Figure 4). In this case, the main load falls on the steel cables, which prevent the suspension bridge from bending deformation. Steel cables are more resistant to external loads than reinforced concrete and do not allow it to collapse.

Figure 4. General view of a steel cable-stayed suspension bridge .

Therefore, it would be beneficial for future construction engineers to present examples of the application of the topic of deformation in construction in the classroom.

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