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COMPARISON OF THE DEFORMATION OF AN ELASTIC ELEMENT MADE OF DIFFERENT TYPES OF METAL

Abstract. Comparison of the deformation of an elastic element made of different types of metal. The elastic elements of machines and devices, providing the necessary tension with their elasticity, accumulating energy or acting as a shock absorber, usually occupy a small place in the nodes of structures, but they are always an important link in all mechanisms including these elements o' lg'.

Keywords: metal, energy, elastic element, elastic modulus,

Introduction.

The material of the elastic element has various requirements. These requirements depend on the purpose of the elastic element and the conditions of its operation [1].

Dispersion-hardening alloys based on nickel-iron-chromium have sufficient plasticity in the soft state and high mechanical properties after thermomechanical treatment (hardening + deformation + aging). A typical representative of such an alloy is 36HXTIO (GOST 10994-74 *). Compared to beryllium bronze, these alloys have higher corrosion and thermal resistance [1].

36NHTY alloy has a high elastic limit. Many elastic elements of complex shape are made from it. These elements operate at high voltages, in aggressive environments and at elevated temperatures [1].

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Alloy 36NHTY is used for the manufacture of elastic and elasto-sensitive elements operating at temperatures up to +250. Type - precision alloy with specified elastic properties.

Among the main advantages of 65G steel are the following:

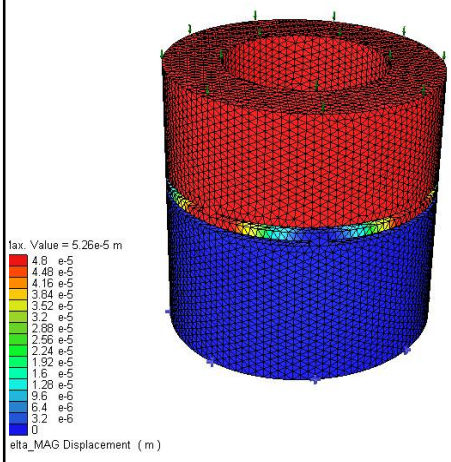
- a huge margin of safety. This suggests that even with high mechanical loads, the products will not break, deform;
- high resistance to impact deforming loads [2].

It is known that 65G steel has a number of negative qualities that create certain restrictions on the use of the alloy [2]:

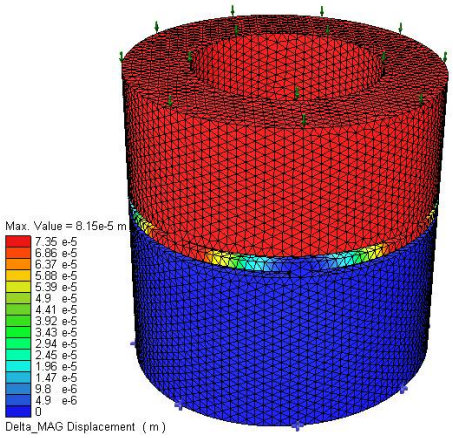
- strong susceptibility to corrosion due to the fact that steel belongs to the group of carbon-containing;
- has a lot of restrictions in the scope.

It is worth noting that both advantages and disadvantages are relative properties. To attribute them to absolutely any product from this alloy is impractical. This is easily explained by the fact that each steel producer uses production technology with some changes. Naturally, in this case, the products will also differ [2]. Let us now compare the mechanical properties of steel 65G and alloy 36NHTY.

Material grade	Temporary resistance $\sigma_в$, MPa	Yield strength $\sigma_{0,2}$, MPa	Elastic strength $\sigma_{0,005}$, MPa	Endurance limit σ_{-1}, MPa	Elastic modulus $E \cdot 10^{-4}$, MPa	Elongation δ, %
65Г	1000	800	-	660	20	8
36НХТЮ	1200-1300	800-1000	650-750	-	19-20	14-18



Steel 65Г



Alloy 36NHTY

Again, when comparing the two materials, we see that 65G steel is less amenable to deformation under the same loading conditions and completely identical designs and sizes of the object under study.

And again, I conclude that 65G steel is more suitable for an elastic element in the form of a slotted spring for vibration cutting.

Used literature.

1.Ponomarev S.D., Andreeva L.E. Calculation of the elastic elements of machines and devices. - M.: Mechanical Engineering, 1980. - 326s., Ill. (B-ka calculator)

2.https://fb.ru/article/389777/opisanie-stali-g-material-dlya-proizvodstva-nojey