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EXPLORATION OF THERMO-PHYSICAL PROPERTIES OF ALLOY OF REAR-EARTH METALS IN THE HIGH TEMPERATURE ZONE

Intensive study of thermo-physical properties of rear-earth metals and their alloys allow to increase using them in current science and technology.

Alloys comprising rear-earth metals have unique physical properties.

In particular, steadiness of these alloys to thermal and mechanical loads in high temperature give the possibility of using them in construction materials in space and aeronautical engineering and make difficult peculiar properties of physical process that flows in alloys of rear-earth metals in high temperature phase change.

The purpose of my work consists of the following:

- carrying out complex measuring of thermo-physical properties of heavy rear-earth metals alloys in temperature zone from 5–7 thousand degrees Kelvin up to melting temperature;
- analysis of possible mechanism of heat transfer in these alloys in high temperature zone;
- realizing exploration of thermo-physical properties in the zone of temperature transformation.

At present I revise apparatus for measuring these properties.

In my scientific work I need using many users manuals for analog input-output PC cards in English for creating software for analyzing signals from metal alloys sample by Phurrie method. Choosing of electric elements and fastest methods for programming and handling data are discussed in this document.

For understanding mechanism of heat transfer in these alloys and methods for getting of thermo-physical properties by measuring temperature waves of metal alloys sample I read "Electro-optical Imaging: system performance and modeling" by Lucien M. Biberman and Robert L. Sendall. This book is one of the best review of thermo vision devises from 1930's when it began to our days and one of the most interesting tutorial of building thermo vision/measuring systems.

This document reports history and methods for creating thermo measuring systems of infrared and near infrared waves length and defines generations of these devises by methods of imaging.

It illustrates properties of different spectral diapasons for defining transmission in atmosphere window electromagnetic waves main spectral diapason 3–5 micro M and 8–12 micro M, that became standard for thermo vision devises all over the world, it also defines requirement for hardware, optic system and electric circuits.

This document presents the history of approach for measuring temperature, temperature scale and defines physical advantage of this scale.

It considers methods for modeling thermo vision/measuring systems and calibrating these devises, involve parameters for observer eye.

The definition of black-body and standards of thermo constant and measuring scales, that may be used in my work is of particular interest.

Д. Е. Евсеева

DESIGN IN OUR LIFE

Up until the Industrial Revolution objects were made by craftsmen, either working on their own, collectively in rural cottage industries or in Guilds or Societies in the towns. The majority worked at a low level of skill and design, producing simple buildings, furniture, plates, etc.

There also were a few craftsmen who worked for the nobility and the rich merchants producing objects based on designs and technology taken from other countries but it was also of a very low standard with very little thought for the user.

In those days designers were either architects or artists and men felt no need to use them. In the early part of the XIX century, people began to realize that there was a problem. The architect, Charles Cockerel said, «The attempt to supersede the work of the mind and the hand by mechanical process for the sake of economy will always have the effect of degrading and ultimately ruining art». Many years later, the Bauhaus used technological processes as the basis of their designs.

Since that time till nowadays there appeared different styles and schools of design like Art Nouveau which developed a new style of curving lines, asymmetrical design and elements of fantasy, Art Moderne and Art Deco was characterized by the use of rich materials, repeating motifs, the influence of cubism but also historical influences especially non-western applies and fine arts.

Nowadays design is everywhere – and that is why looking for a definition may not help you understand what it is. Design is everywhere. It is why you bought the last piece of modern furniture and it is what made online banking possible.