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**Experimental Investigations of the Thermo-physical Properties  
of New Materials up to 1600 °C  
to Optimize Processes of Thermal Treatment**

The research has two main objectives:

The determination as well as the comparative estimation of the three thermo-physical values, thermal conductivity, heat specific capacity and density, of newer and common materials in the temperature area until 1600 °C. If necessary the transitional phases to the corresponding temperatures and enthalpies will be also measured. For this purpose, the following equipment will be used:

- Laserflash Apparatus
- DSC (Differential Scanning Calorimeter)
- Simultaneous DTA / TG (Differential thermal Analysis, Thermogravimetry)

The materials to be considered are:

New materials, from which no values or not temperature dependence have been determined, common representative materials, from which no properties have been established in the high temperature range, and/or materials from the literature references. These materials include: Low Strength Steels, High Strength Steels, Heat Resisting Steels, Coat Steel, Alloys, and Oxidic and non oxide heat resisting materials

And other materials needed as a complement for the evaluation of material categories, alloys, or production process.

Within the scope of the research, the influence of the measuring techniques will be also analyzed, in order to establish the accuracy of the results and the precision of the equipment. For this purpose, samples of the chosen materials will be also studied in the University of Duisburg, where a Hot Wire Disk will be used to determine Conductivity.