

Physical Properties of Pt Materials and Pt DPH Materials

In addition to platinum and the conventional Pt-Rh alloys, there are the oxide dispersion hardened versions of these materials which can be used at even higher temperatures in a very wide variety of applications because of their higher levels of strength.

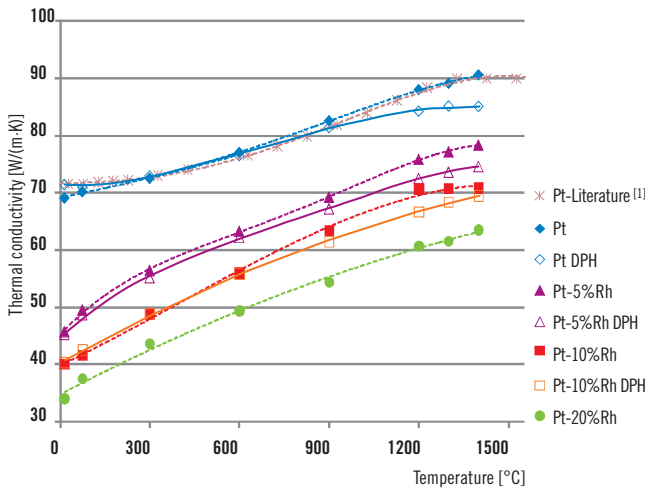
In these applications, it is very important to know the physical properties of each material, e.g. the thermal conductivity, density, thermal expansion characteristics and the electrical resistivity.

The thermal conductivity comprises the thermal diffusivity, density and specific heat of the material.

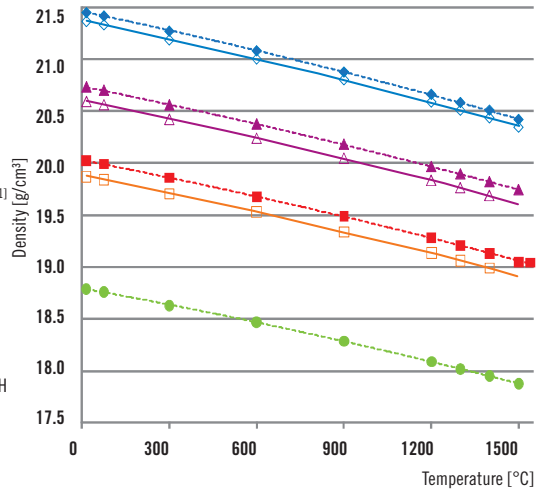
The thermal diffusivity is measured by the laser-flash method. The temperature dependence of density is characterized by determining the thermal expansion behavior with dilatometer measurements. The specific heat is determined by DSC (differential scanning calorimetry). The 4-point method is used to measure the electrical resistivity, in order to ensure that the results are not affected by the resistance of the leads. A constant current I is fed into the sample by means of two leads and the potential drop U is measured by two further leads positioned between the current leads. The resistivity is calculated from the sample geometry and the measured values of current and potential.

Physical Properties

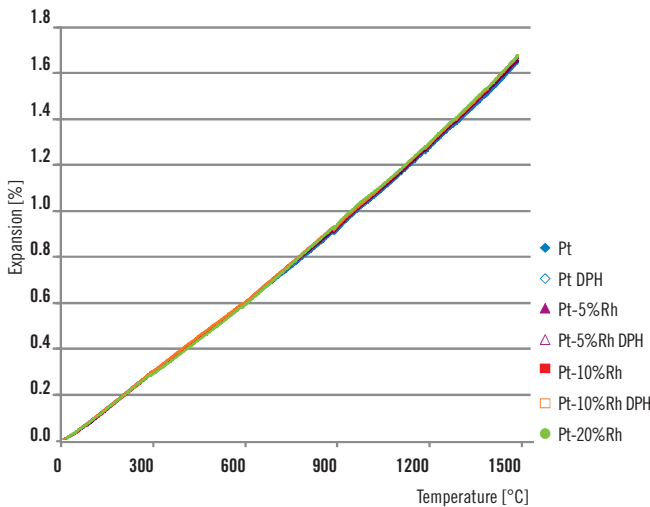
Thermal Conductivity



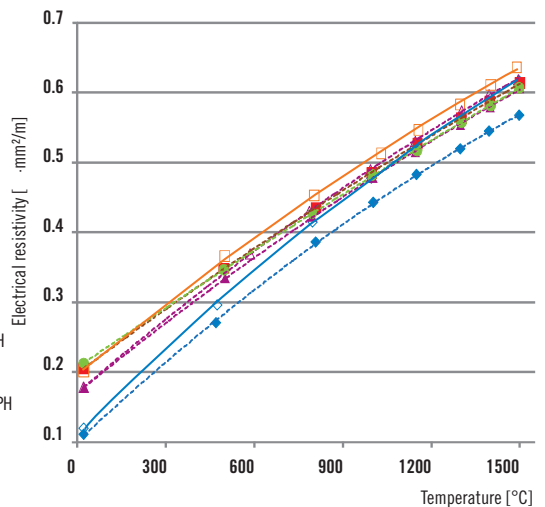
Density



Thermal Expansion Characteristics



Electrical Resistivity



Specific Heat [J/(K · g)]

	30°C	75°C	300°C	600°C	900°C	1200°C	1300°C	1400°C	1500°C
Pt ^[2]	—	0.13*	0.14*	0.15*	0.16*	0.17*	0.17*	0.17*	0.17*
Pt-10%Rh	0.14	0.14	0.14	0.14	0.15	0.16	0.17**	0.17**	0.18**
Pt-10%Rh DPH	0.15	0.15	0.14	0.15	0.15	0.16	0.17**	0.17**	0.18**

* interpolated from lit. [2]

** extrapolated from Heraeus measurements

[1] Platinum Metals Review, 1984, 28, (4), pp.165

[2] Edelmetalltaschenbuch, Giesel Verlag, 2001, p.109

Heraeus Materials Technology GmbH & Co. KG

Engineered Materials Division

Business Unit Precious Metals Technology

Heraeusstr. 12-14

63450 Hanau, Germany

Phone +49 6181.35-3740

Fax +49 6181.35-8620

precious-metals-technology@heraeus.com

www.wc-heraeus.com/precious-metals-technology

www.pt-labware.com

The photographs, diagrams, drawings and texts contained in this material data sheet are protected by copyright in favour of Heraeus. Any and all resulting rights, in particular the right of translation, reproduction, taking of figures, illustrations or photographs, photo-mechanical reproduction etc. and storage in EDP plants, shall remain reserved even if only excerpts are taken. They may only be exercised after prior written consent of Heraeus.

The data contained in this material data sheet have been obtained at Heraeus under laboratory conditions to the best of Heraeus' knowledge and under observation of the latest state of the art. However, Heraeus does not assume any responsibility for the correctness and completeness of these data or any responsibility that the respective user will obtain the same data under its concrete conditions. Each user shall examine on its own responsibility whether the products of Heraeus are suited also under its own conditions of use and for its own intended purpose of use.