

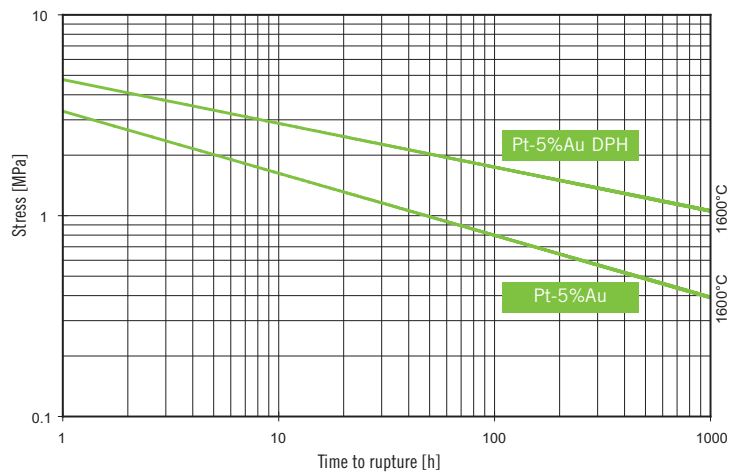
Pt-5%Au DPH

Pt-5%Au DPH is an oxide dispersion hardened version of the widely used alloy Pt-5%Au. Samples for many analytical techniques (XRF, ICP, AA, etc.) are commonly prepared by fusing with a borate flux. In particular for XRF analysis, the fused borate glass samples are then cast as discs that can be directly analyzed in the spectrometer. The contact angle of molten glass on Pt-5%Au, about 65°C at 1300°C, is almost double the value for pure platinum, i.e. the surface of the alloy is not wetted readily by the flux. Because of its favorable wetting characteristics, Pt-5%Au has for many years been the material of choice in the preparation of analysis samples.

Pt-5%Au DPH combines the well known advantages of Pt-5%Au with significantly improved mechanical strength at very high temperatures. This greatly reduces the danger of distortion that can arise from the handling of hot crucibles or exposure to rapid temperature changes. Furthermore, the oxide dispersion ensures that a fine grain structure is maintained even during exposure at the highest temperatures, thus minimising the dangers of corrosion by "platinum poisons".

Stress-Rupture Strength of Pt-5%Au and Pt-5%Au DPH

Stress-rupture test: A specimen of the material is subjected to a defined stress and the time to rupture of the specimen is determined. The time to rupture is measured for each temperature on a large number of specimens at different stresses and plotted in the stress-rupture diagram.



High Temperature Mechanical Properties of Pt-5%Au and Pt-5%Au DPH

The values given in the following table summarise the results of tensile and stress-rupture tests on Pt-5%Au and Pt-5%Au DPH. As these materials are not generally used for load-bearing structural applications, mechanical property data for the design of components are not usually required. This summary is intended to assist in deciding whether Pt-5%Au or Pt-5%Au DPH is required for a particular application.

	1200°C		1400°C		1600°C	
	Pt-5%Au	Pt-5%Au DPH	Pt-5%Au	Pt-5%Au DPH	Pt-5%Au	Pt-5%Au DPH
R_m [MPa]	45.1	45.0	19.2	24.7	9.7	13.1
R_{p0.2} [MPa]	39.4	42.6	18.5	23.8	8.7	12.1
A [%]	33	16	62	48	70	60
R_{m/1,000h} [MPa]	–	–	–	–	0.4	1.0

R _m	Tensile strength
R _{p0.2}	Yield strength
A	Tensile elongation
R _{m/1,000h}	1,000 h stress-rupture strength

W. C. Heraeus GmbH

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

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