

Welding the Pt DPH Materials

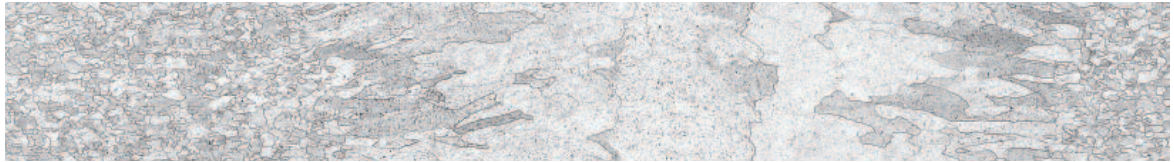
The Pt DPH materials are characterized by exceptionally good weldability. They can be welded using all standard techniques including tungsten inert gas (TIG), laser and electron beam welding.

In many instances it is possible to weld the Pt DPH materials without the use of filler metal. A remarkable feature of these welds is the high strength which is maintained after welding. Usually the strength of oxide dispersion strengthened materials decreases to that of the unstrengthened conventional alloy on welding

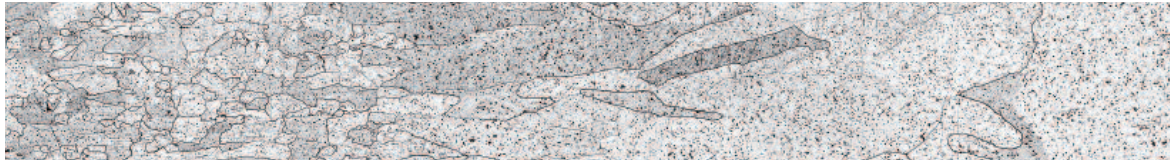
because the quantity of dispersed oxide phase is reduced in the weld zone. However, the strength of the Pt DPH materials is largely maintained after welding and is considerably higher than that of the conventional, non-dispersion strengthened alloy.

If the use of filler metal is necessary, we have a number of products available which permit the weld strength to be optimized. We are pleased to advise our customers on the best solution.

Microstructure of a TIG Weld Seam in Pt-10%Rh DPH



Cross-section through unaffected sheet, heat-affected zone and fusion zone.



Detail of microstructure in unaffected sheet, heat-affected zone and fusion zone (from left to right). The oxide dispersion is still present in the heat-affected zone and fusion zone.

High Temperature Stress-Rupture Strength of Welded Pt-10%Rh DPH

In many instances it is possible to weld the Pt DPH materials without the use of filler metal. The following table shows the 100 h stress-rupture strength of Pt-10%Rh DPH after butt welding without filler metal. The tungsten inert gas (TIG) technique has been used. For comparison, the strength of the unwelded Pt-10%Rh DPH is shown together with the strength of the conventional, non-oxide dispersion strengthened alloy Pt-10%Rh.

	100 h Stress-Rupture Strength [MPa]			
	1200°C	1400°C	1600°C	1700°C
Pt-10%Rh DPH TIG welded	11.3	6.1	3.4	2.6
Pt-10%Rh DPH unwelded	10.6	7.8	5.0	3.7
Pt-10%Rh conventional, unwelded	7.4	3.8	1.5	0.8

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