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Temper Embrittlement of Cr-Mo Pressure Vessel Steels

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Synopsis :

An investigation has been made of the influence of silicon, manganese, phosphorus and austenitizing temperature on the temper embrittlement of 2 1/4Cr-1Mo steel which is well known for its higher susceptibility to the embrittlement among Cr-Mo pressure vessel steels. According to this investigation the following tendency is observed. (1) Decrease in silicon, manganese or phosphorus content lowers the susceptibility. However, lowering of silicon or manganese content decreases the strength. (2) Though raising of austenitizing temperature promotes the susceptibility, this procedure increases the strength. It is concluded that Cr-Mo steels with high strength and low susceptibility to temper embrittlement can be obtained by lowering phosphorus content sufficiently or quenching from higher austenitizing temperature under the condition of low silicon, manganese and phosphorus contents.

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Temper Embrittlement of Cr-Mn Pressure Vessel Steel*

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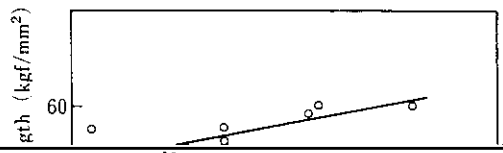
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P (%)		P (%)	
○	0.005	●	0.014~0.016
○	0.008~0.009	●	0.021



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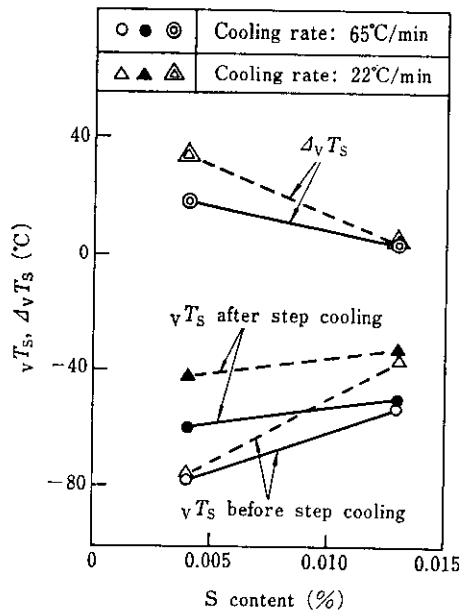


Fig. 11 Influence of sulfur on temper embrittlement of 2 1/4Cr-1Mo steel

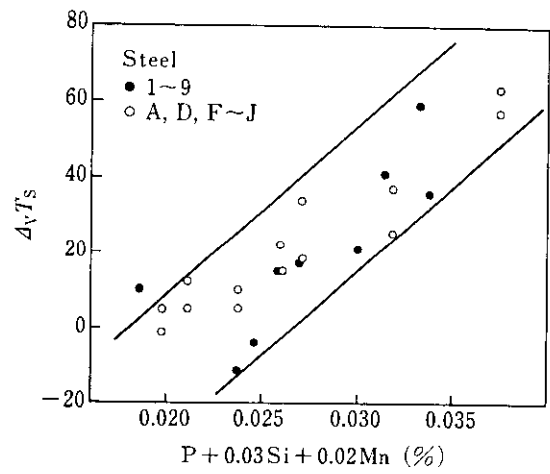


Fig. 13 Influence of phosphorus, silicon and manganese on increment of fracture appearance transition temperature of 2 1/4Cr-1Mo steel

	Mn (%)	Austenitizing condition	JIS austenite grain size
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the above experiment are compared with those of Fig. 6. Martensite is the main microstructure in both,

However, it is not rare for these measures to be

References

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